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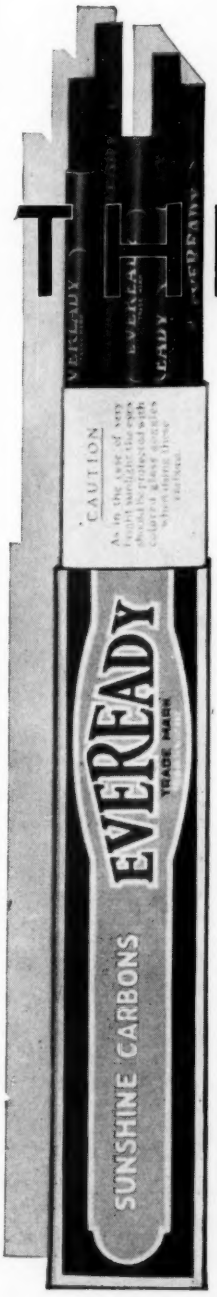

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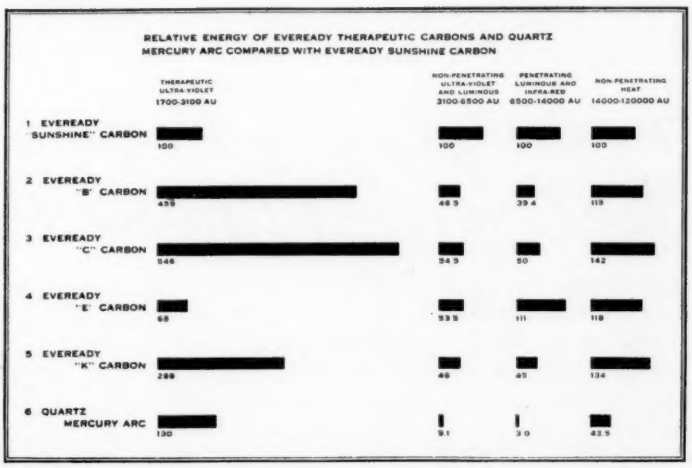

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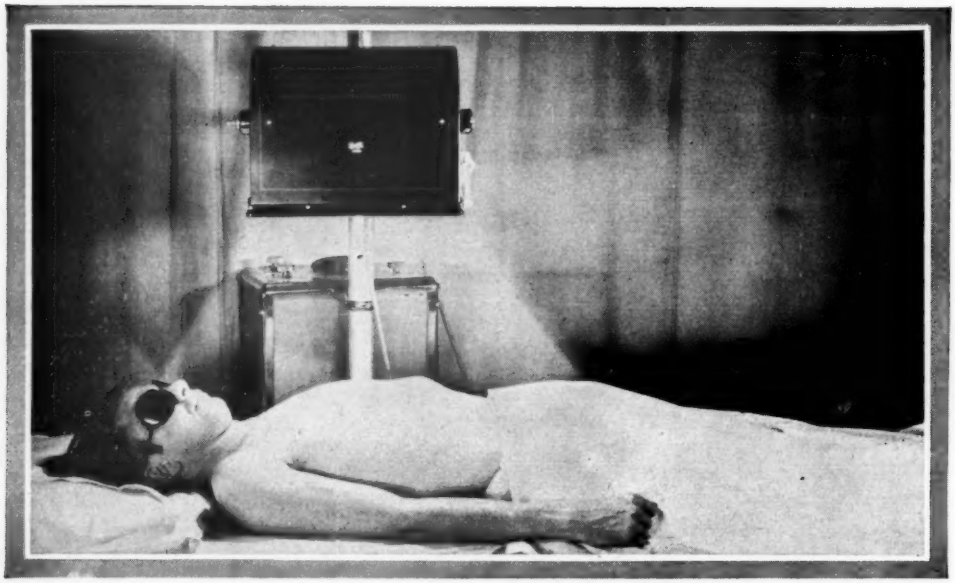

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—A. J. CEMACH, M.D. *An extract from his article, "Ultraviolet Therapy in Oto-Rhino-Laryngology," read before the Second International Conference on Light and Heat in Medicine and Surgery, University of London, 1928.*

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VOL. X OCTOBER, 1929 No. 10

EVOLUTIONARY MODIFICATIONS OF TONSILLOR-ELECTRO-ENUCLEATION*

F. PETER HERMAN, M. D.

CLEVELAND, OHIO, AND PALM BEACH, FLA.

As in most instances we are all more or less indebted to others for various thoughts which prove to be seedlings of ultimate full tree growths. In this connection I wish to thank Drs. Hollender and Cottle for their contributions (a-1) to our literature on surgical diathermy of the tonsil.

The specific procedure (which I have been pleased to call Tonsillor-Electro-Enucleation), presents a most interesting evolutionary picture. It carries one from the heartily and justly condemned "Fulguration Tonsillotomy" (a); through a period of the large distant disbursing electrode, to the present double active electrode principle.

Fulguration, from the standpoint of eradicating disease in the tonsil, has thoroughly disproven itself (a-2). However, it served its purpose, and an honorable one, in the role of catalyst.

After having used, tested, and found wanting, all the then existing technic known to the writer, dealing with electrical applications, of any nature, to the tonsil, they, as well as the mechanical phases were for a time put aside. The blood and its various constituents were reviewed and considered. The latest literature was investigated for its articles on coagulation.

*Read before the seventh annual meeting, American College Physical Therapy, Chicago, Oct. 11, 1928.

For the benefit of those of us who may not be able at this moment to recall the normal coagulation process of the blood, I will briefly elucidate:

The more important coagulable proteins, normally contained in the blood plasma are: Seralbumin, serglobulin, and fibrinogen (M-1). The latter has a wide variation as to amount, in that it is greatly increased whenever there is a prolonged leukocytosis, sometimes reaching as much as 0.9 per cent of the whole blood (M-2). This fact is most interesting to the writer, inasmuch as it is this constituent, fibrinogen, that possesses the lowest thermic-coagulating point. (M-3). Further that it is increased in amount, to a great extent in all diseases having a leukocytosis. It is under this category that the specific condition falls, that prompted the entire work herein described, namely, diseased tonsils. It also opens most interesting avenues for research tending to increase the coagulating time by bringing about an increase in the leukocytes, either by the injection of a foreign protein, or by the use of the tonsil leukocyte test (e). The other blood plasma proteins coagulate at about 70° C., which is also the temperature necessary to coagulate all other body tissues (M-3).

As stated by Mathews (M-4):

"A rise in temperature increases the motion of the atoms in the molecule and thus increases their lability. It shortens the

period of reaction by shortening the time taken up in the intermediate stage and so hastens the reaction. It accelerates by diminishing the resistance, but does not so greatly affect the chemical affinities. Heat having this double action accelerates chemical reactions more than physical. Nearly all vital reactions or activities are doubled or trebled by a rise of temperature of 10° between the limits of 10 to 40° C."

The fact that no heat is disengaged in the normal reaction of blood clotting, is significant that heat is a vital constituent of the process; also that the addition of a slight amount of heat will hasten it. It is noted, that to complete the full reaction of syneresis, requires up to thirty minutes. In this connection, it is believed to be most evident that the addition of heat greatly accelerates the process by its dehydrating effect, thus eliminating the serum constituent, as well as specifically clotting the fibrinogen, thereby reducing the bleeding-time to nil. A further fact, to be dealt with more fully later, is that the clotting is greatly accelerated by the blood coming in contact with wounded tissue surfaces, owing to their extracts, sometimes called thromboplastic substances. These thromboplastic substances (also known as tissue fibrinogens) do not clot themselves as the result of the fibrin present, but coagulate at 56° C., and are present in a great variety of tissues of the body (M-5).

Working from the premise that in order to instantly clot fibrinogen at 56° C., there would be a like instantaneous activation of fibrin, (the essential constituent of a clot) experiments were conducted. From the work to date the present opinion held is, if living tissue at the point of severance is slowly raised to 68° C. there will be no bleeding. (Excepting in the case of an anomaly.)

From this finding it was necessary to construct a tonsillotome so that it would be synchronous in its action with the normal physiological facts, as well as with the action of a properly constructed diathermy machine, i. e., a surgical instrument embodying the necessary requisites for good surgery as well as possessing the inherent structural changes necessary for its electrification. The diathermy machine to be flexible in its types of current output, and to be under complete control of the operator at all times, regardless of the current variations essential at various stages of the operation.

The use of the large, distant, inactive or disbursing electrode in conjunction with the active snare electrode, insofar as tonsillectomy is concerned, is not the most apt procedure. It was used by the writer (c), and others (d), for a considerable length of time. The difficulty in this usage being the adverse directional forces of the current, (toward the large disbursing electrode), plus the great amount of current necessary with its intense heat created at the snare, thereby causing, in the event of too great a current strength, a severe extensive coagulation, or charring of the fossa, with its subsequent sloughing and bleeding.

In the recent developments of the instruments, to carry out the above views as to better current control and its interposition in the operation, the distant large disbursing electrode is eliminated. The original idea of the Beck-Mueller type of instrument is followed (Fig. 3). The snare wire retains its position as the active electrode. The disbursing electrode has taken

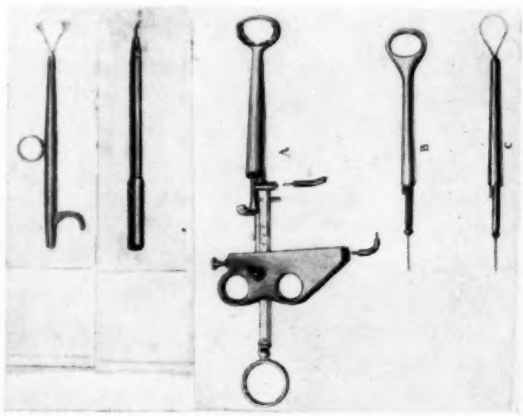

Fig. 1 Fig. 2 Fig. 3

Fig. 1. The separate monopolar seizing forceps. This instrument may be used in connection with the "radio-knife" or dissector (Fig. 2), in any type of surgery, i. e., removal of malignant tumors, etc.

Fig. 2. The "radio-knife," or dissector. May be used as stated (Fig. 1), or to fulgurate bleeding points.

Fig. 3. A—The Electro-Enucleating-Tonsillotome with attached seizing forceps. (a) The snare wire which is the active electrode. (b) The disbursing electrode connected to the seizing forceps. B—The interchangeable plain loop for use with the separate seizing forceps. C—The interchangeable open snare—for use in the dissection method or for securing small pieces. Also used with the separate seizing forceps.

the form of a seizing forcep, and is placed on the tonsillor side of the loop. The instrument is so designed as to allow the seizing forcep to be forced into the tissue, upon closing, thus bringing about a good electrical connection. It is noted that this arrangement results in the current being directed into that tissue to be removed (in this case the tonsil), and away from that to be protected (the fossa).

It is a fact that both the size of the contacting surfaces of the electrodes, together with their immediate location, in reference to the size of the mass engaged, have a decided bearing on the time required, at a fixed, gradually increasing, current strength, to produce the desired coagulation.

The herein described instrument is so constructed that the time necessary to produce a proper coagulation and severance, ranges between four and eight seconds, after placing the electrodes and the current applied, required to produce the proper hemostasis and severance.

In using the double active electrode principle, it is, of course necessary to standardize all vital parts of the instruments, i. e., the snare wire lengths, electrode sizes, etc.; also to employ a diathermy machine capable of delivering a type of current that predominates in coagulation qualities, but still having a cutting property. This, however, in modern manufacture is a simple accomplishment (Fig. 5).**

TECHNIC

The procedure in using the instrument is simple (Fig. 4). The tonsil is engaged through the fenestrum. The snare is drawn taut. The seizing forcep is made to grasp the mass. Pressure is then applied on the rheostatic foot-switch, and brought gradually up to 300 m.a. over the time indicated for the mass engaged. Simultaneously, a gentle pressure is applied on the carriage of the tonsillotome, thus utilizing the current's cutting properties.

A small amount of blood is not the most undesirable condition, as it indicates the coagulating effect has been effected, but not excessive in amount. In the event one does not get the desired hemostasis, a short application of a heated sponge will be the remedy. This is ac-

Fig. 4

Fig. 5

Fig. 4. Showing bipolar, Electro-Enucleating-Tonsillotome being applied to the tonsil. The snare is the active electrode. The seizing forceps the disbursing electrode.

Fig. 5. The two tube diathermy machine as used by the writer. The frequency is 997,000 cycles and is constant. Because of the unique, and what is believed to be, entirely new, interposition of balanced resistors, the current, which would ordinarily be of an undamped character from this type of oscillating equipment, is slightly damped. The oscillogram demonstrates this slight dampening. The current is absolutely constant in character. A condition which is not found, generally in the sparkgap type equipment. With this constant and absolutely reliable current, all operative technic remains likewise fixed, as to cutting or coagulation, or a combination thereof. With properly placed electrodes, and the use of the rheostatic foot-switch (introduced and used by the writer); all surgery is made a procedure of extreme precision. The extent of cutting being under the absolute control of the operator, from an infinite degree to an inch or more. The degree of coagulation is likewise controlable. A neatness and thoroughness of dispatch, is unequaled by any other surgical technic, electrical or otherwise. (This machine weighs but twenty-one pounds, which is a most desirable portable feature.)

complished by grasping a damp sponge in separate bipolar seizing forceps of the kind hereinafter mentioned, and heating it as one would the tonsil, thus bringing about the desired interfossa temperature to cause coagulation. It is the conviction of the writer, however, that, after having synchronized one's technic, a bloodless result will be most universal.

A fault (if justly so) claimed against the procedure, has been that it involves an individual technic. For the type of cases not adaptable to the fenestrated instrument, and to go farther in the perfection of a technic readily applied by one proficient in the operation, regardless of method employed, a separate bipolar seizing forcep has been constructed (Fig. 1). It follows a like double active electrode principle as used in the tonsillectome. This instrument allows one to bring about the desired temperature within the grasped mass, regardless of the type of tonsillectome, or method employed. It is also used as a monopolar seizing forcep in connection with an electrified open snare (Fig. 3), i. e., dissection method; small pieces of tissue; or in securing the lingual tonsil.

Before concluding I wish to state (f) that the coagulation time is given careful attention, and the operation is not performed in the case of a prolonged time, until it has been reduced to within normal limits by hemostatic agents.

CONCLUSIONS

The results of the procedure are:

1. The operative bleeding being reduced to nil, thereby eliminating the oftimes postoperative sequelae, i. e., pulmonary abscesses, pneumonia, etc., in those cases having had a general anesthetic (g).

2. Secondary systemic conditions resulting from metastasis are completely eradicated. This one advantage, placing the method high in acceptance, and without a peer, in its use in malignancy (h).

3. A reduction in the number of those cases requiring a general anesthetic. (The writer finding it possible to do 100 per cent of all cases over fifteen years of age under local anesthetic.)

4. The ordinary tonsillectomy is reduced to a simple office procedure, assuring hemostasis, thereby eliminating ligatures.

5. The after pain is less, due to the lack of manipulation of the tissues.

6. A profound psychological effect is produced on the patients, or the parents, owing to the absence of blood and the short time necessary to perform the operation.

7. The convalescence is shortened.

8. The resultant scar is soft and pliable, and rapidly becomes absorbed, leaving a smooth mucous membrane.

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**All experimental instruments manufactured for the writer through the courtesy of The Wappler Electric Company, Long Island City, New York.

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THE CAUTERY PUNCH OPERATION*

JOHN ROBERTS CAULK, M.D., F.A.C.S.

ST. LOUIS, MO.

Before considering the mechanics of "The Cautery Punch Operation," permit me to explain the indications for this operation and, above all, state that through this particular type of physical therapy, the explanation of the histogenesis of prostatic obstruction in the majority of instances has been explained. This operation, which I described in 1919, was primarily designed for the correction of contractures of the vesical neck and median bar formations. It was definitely proved that the instrument could effectively cure the majority of such obstructions with but little danger to life and with few complications. Gradually this operation was applied to some of the larger obstructions, one which in my experience had always been dealt with by major surgery and it was found that the results were equally successful in these larger growths following one or sometimes several operations.

The striking lesson that was learned in operating upon these large obstructions was that after the removal of but small portions of these growths the remainder of the gland diminished in many instances in a surprisingly short period of time to normal dimensions. The tissue removed at operation was histologically typical of what has been considered neoplastic.

In following this operation in quite a series of cases of large obstructions, this same transformation of growth has been observed. It would seem, therefore, that this gives us a clue to the origin of prostatic overgrowth in many instances. It has been estimated that 30 per cent of men beyond fifty have prostatic enlargements. It is quite unreasonable to believe that a tumor should affect the prostate out of proportion to any other gland or organ in the human body.

Because of the great frequency of infections in the prostate in early life it would not be surprising to find infection in the background of late lesions in this gland in such a percentage as we see hyperplasia. To substantiate this I analyzed the cases of prostatic inflammations which have been under my observation and found it extraordinarily rare for a prostate which has been treated for a chronic infection to develop an overgrowth later in life. In other words, the relief of infection protected from late pathological overgrowth. On the other hand, I have seen over 100 cases presenting various degrees of prostatic enlargement with obstructive symptoms, some with complete retention who have been entirely relieved of the symptoms of prostatism and have perfectly normal prostates today without the employment of any method of surgical attack, simply by relief of infections through the means of local treatment and the applicaton of diathermy to the prostate. Many of these patients have been followed from five to eighteen years and have shown no tendency to recurrence.

The process of absorption in many of the larger obstructions following the relief of tension at the orifice after the obstruction has been removed, has in many instances, been rapid. It results unquestionably from the relief of tension with congestion, edema and irritation, with absorption of inflammatory growth, and is not out of line with the rapid absorption of inflammatory hyperplasias in other parts of the body. Many of you have observed chronic cervicitis with large inflammatory hyperplastic growths which have rapidly subsided after incision and free drainage. It is evidently true that the various acini of the prostate have harbored infection due to blockage of their excretory ducts and that this process has been going on over a period of years because of inefficient drainage. With interference at the internal orifice of the bladder, edema and congestion is super-imposed and it is after the relief of this with incision and drainage that rapid absorption may be expected. Many pathologists have felt for years

*Read at the seventh annual meeting, American College of Physical Therapy, Chicago, Oct. 11, 1928.

that a considerable number of prostatic hyperplasias, so-called adenomas, were inflammatory in their nature. Ewing has been a very ardent advocate of this theory but had nothing but histological proof since the prostate was either left intact or completely removed. It is through this instrument then, a type of physical therapy, that for the first time there has been a definite proof given that many such lesions are inflammatory.

Following this lead I have been able to apply this operation to 70 per cent of all obstructions at the internal orifice of the bladder with the most gratifying results.

These instruments are made in two models —one for low voltage transformer which is made in three sizes, namely, 14, 26 and 30 French. The size 14 is for children. The other is a high frequency model made in size 30 only and was put in operation January 1, 1928.

The low voltage type instrument was perfected in 1920. In this instrument the outer sheath with its obturator carries the lamp attachment for observation which is detachable. The punch tube carrying the blade which does the cutting, telescopes back and forth inside the sheath. A specially constructed syringe which fits the 20 cc. Luer glass syringe is furnished with the instrument to infiltrate the orifice with the anesthesia. The punch tube with its circular platinum blade and electrical connection is the most important part of the instrument. The platinum blade itself being one-fourth of an inch wide and full diameter of the punch tube. All electrical currents require two wires to give service, one wire conducting the current to the instrument and the other conducting it away. As part of the punch tube there is furnished a cord connection having a handle which fits the punch tube with a slip joint. It is detachable and supplies the current. The bronze tube itself being grounded conducts one side of the current to the platinum blade which is securely attached thereto, while the current is drawn away from the platinum blade by the attachment of an insulated rectangular copper bar passing through the center of the punch tube. At the outer end of the tube suitable electrical connection is mechanically formed as part of the handle to the tube.

The alternating current supply of 110 volts is run through a transformer which is ground free and in turn lowers the voltage to six volts and transforms the amperes to about 100, suitable to heat the platinum blade, in varying degrees of heat according to the case at hand. It will be seen that six volts cannot possibly give anyone a shock and it is almost impossible to short circuit. The interval of time that the instrument is being used, not being more than two minutes, does not allow the instrument to become heated.

The problem of electrical insulation has been evolutionary, the present electrical insulation being much better than when the instruments were first made. Changes have been made in the instrument from time to time. The platinum blade has been changed to a more expensive alloy of irodium and platinum, which is very hard and does not soften with heat; gradually these blades have been made thicker and their supports larger, yet not interfering with the working of the instrument, but making its useful life longer. The sheath or outer tube has undergone changes from time to time and is now made in one piece, the reinforcement at the slot opening of the sheath tube, formerly an extra piece being soldered on, is now not needed as this reinforcement forms a part of the original tube of the sheath and is made of hard drawn bronze which remains rigid for all time.

The new high frequency punch instrument differs from the former model in that the outer metal sheath has an interior insulation of Bakelite throughout its length, but the punch tube has no metal except the blade and the part of the outer handle. It is especially insulated to carry the high frequency current through its center up forward to the blade, the exposed part of which is very narrow in width and forms part of a steel cylinder deep enough to cut the width of a thumb. There is but one electrical connection, the bipolar high frequency current being used the other wire is attached to a metal pad placed at the patient's back. Thus it will be seen that the current must pass through the patient's body in order to operate the instrument. The patient does not feel the current and 2500 milliamperes d' Arsonval current has usually been found sufficient.

In the low voltage instrument, the platinum blade of the punch had to be divided throughout its width in order to pass the current around the circular blade to make it red hot. This division was only hairs breadth, the blade being so anchored to the punch tube as to not allow this division to interfere with the cutting of the instrument. In the high frequency instrument this blade is closed and is a one-piece steel cylinder about one inch long, the cutting edge of which operates practically cold. It is impossible to bend or burn out this type of blade, while if the operator imposed too much current on the low voltage platinum blade there was a possibility of melting it, just as a lamp would be burned out if too much current would be applied.

The theory of cutting with the punch for high frequency current is rather interesting, and success was found to depend upon the depth of the cutting blade which was exposed in the tissue and this depth seemed to bear some ratio with the diameter of the punch tube. The exposed part of the blade has definitely been determined to be one-sixteenth of an inch wide for the size 30 instrument, a wider exposure chokes the instrument. The plain circular tube blades made like the non-electrically operated punches will not answer for this purpose. All insulated parts of the punches are now made of Bakelite in various compositions most suitable for the particular part, as this has been found by experiment to be the hardest and best insulator.

TECHNIC

Technic of the operation is simple and yet it requires a thorough familiarity with the endescopic appearance of the urethral orifice. The operation is entirely a visual one and obstruction can be definitely seen at any part of the orifice; the instrument may be rotated at different segments and locate lobules which have been previously determined by cystoscopic study. The visualization of the orifice is perfect and in the hands of trained men it seems to me impossible that one should have any difficulty in knowing the exact nature of the tissue secured in the slot of the instrument.

It is perfectly true that in untrained hands difficulty may be experienced, but this is true with any type of surgery.

The instrument is passed into the bladder after cocainization of the urethra, bladder contents evacuated, and, for the median incision, which is the most frequent one, the instrument is pulled outwardly and elevated at its distal end so as to grasp the obstruction in its slot, the obturator having been previously removed.

With the obstruction in the slot of the instrument the field is dried by suction syringe and the obstruction is visualized by reflection light. It is perfectly easy to differentiate betwen vesical mucous membrane and the internal orifice of the bladder. With the orifice in the slot, the instrument is pressed downward with the little finger of the left hand, upward with the thumb and pulled outward, the vesical orifice is squeezed forcibly into the instrument. Under vision the orifice is then infiltrated with one per cent novocaine through the special syringe.

Following this it will be noted, in most instances, that the orifice relaxes and more tissue may be compressed into the slot. The field is thoroughly dried again by suction and cotton pledgets, neck inspected, then the cautery blade is inserted into the sheath until it meets the obstruction. The amount of heat has previously been tested, the operator then asks for the current to be applied, waits until the frying sound is heard. It is then evident that the heat has reached the blade. If the blade is pushed home before this there is danger of breaking it. This is a very important point and has been responsible for the breaking of many blades in the hands of those who are a little hasty in the cutting of the orifice. When the current is properly applied the operator with his right hand pushes the cautery attachment home by a gentle rotary motion, this takes about four seconds. In case of excision of one single segment of the orifice the operation is over. If one desires to remove one or more bits, the instrument is pushed inwardly into the bladder and the current lightly applied to coagulate the tissue within the blade. In this way it may become adherent to it so as to allow its removal. When it is removed from the sheath the tissue is extracted from the blade and the blade cleaned for another burning. The operator in the meantime engages the orifice and rotates the slot of the instrument to a

desired location and notices the lobule fall into it. This is perfectly plain when the obstruction is within the grasp of the instrument. The same process is repeated as has been given above. I have removed as high as five pieces from the orifice at one sitting. The operation is usually painless as far as the burning is concerned.

In the removal of pieces from the upper or lateral sphincter margins it is sometimes quite unpleasant to the patient on account of the position of the instrument and the tension on the triangular ligament.

The blade of the instrument requires very careful attention, but, with proper care, it is very durable. I have the original blade of my instrument which has been in use for nine years and it has been repaired but once and that simply for tightening a set screw. Some operators have complained that the blade is delicate and that they have experienced trouble with the current. For this reason I have had constructed a high frequency cautery blade which is very substantial and does not require the delicate attention necessary for the cautery blade. It can be used with the ordinary high frequency apparatus. It works very satisfactorily and it has the advantage that the operator is able to manipulate the current himself and is not dependent upon an assistant. The burning is rapid and effective and as far as I have been able to determine, the removal of the obstruction is about the same as with the simple cautery instrument.

At the completion of the operation which usually takes but a very short time after one has gained experience, a large indwelling catheter is inserted, fixed and bladder irrigated to be sure that it is in proper position, some fluid allowed to remain in bladder and the catheter is corked. Patient is put to bed, the cork is removed and continuous drainage instituted. It is important to have a large catheter, at least a No. 24 French, with two eyes. In this way free drainage is given and clots are prevented.

There has never been any trouble with bleeding or any real discomfort in the postoperative course unless clots occluded the catheter, this is the very important point in the postoperative care. For several hours these catheters are watched very carefully, a receptacle of sterile solution and an aspiration syringe are kept at the bedside. If there is any impediment in the drainage it is promptly taken care of. The care of the first few hours is most important. If the drainage promptly clears and in many cases there is absolutely no staining, the catheter is corked and patient allowed to remove the cork at intervals. Daily injection of argyrol or mercurochrome is given in order to keep the bladder and the orifice clean and to hasten healing. The duration of catheter drainage depends upon the type of obstruction and the associated conditions such as residual urine, toxemia and the like. In simple cases it is removed in forty-eight hours. In cases with high residual urines and in large obstructions where a secondary operation is believed necessary it is allowed to remain for at least a week before testing the effect of the operation. If urination is imperfect it is re-inserted until the function is found satisfactory after its removal. These patients require very little sedative, the majority do not require a single hypodermic.

In previous communications I have analyzed all of the cases on which the cautery punch operation has been done and have shown that the symptoms, such as frequency, urgency, incontinence, uremia, etc., are identical to those occurring in the gross obstructions. Residual urine has been the same ranging from one ounce to 1500 cc., the prostate has shown enlargement in 50 per cent of all cases. The prevalence of retention and catheter life has been identical with the gross obstructions and hence offer no clinical differential value.

The interpretation of the type of prostate which is suitable for the cautery punch operation is dependent entirely upon repeated cystoscopic study of the vesical orifice under drainage as well as the transformation of the size of the rectal prostate. If under catheter drainage and splinting of the orifice, hot applications and antisepsis, the prostate begins to diminish in size, and if the cystoscopic appearance is not too gross, that is, there are not large round intravesical lobes with deep clefts, and if the intravesical growth shows recession, there is a possibility that the punch operation can be utilized very frequently.

I cannot urge too strongly repeated studies of the vesical orifice by means of the cystoscope

and repeated investigations of the rectal prostate during drainage. Under this regime many of the prostates which appeared at first to be unsuitable for minor surgery will be found to diminish to such a size as to place them in such a category.

It is therefore seen that these patients must be prepared for the punch operation by drainage in a manner similar to the preparation required for major surgery and oftentimes even in a more protracted fashion.

I have employed this operation 462 times and have repeatedly reported critical analyses of previous cases. It has been definitely shown that the operation is effective in removing sufficient tissue to relieve obstruction in at least 85 per cent of all the cases in which it has been employed. There is no question that it is applicable to the smaller obstructions. This is accepted and it should certainly supplant any major surgical procedure for such growths.

I wish to devote my time to directing your attention to the use of this operation in the larger obstructions and, in stressing this phase, I felt that an analysis of the recent cases on which there is not only a definite statistical study, but a freshness of memory as well, may be more effective. For this reason I shall discuss the 92 operations which have been performed on 55 patients during the last year.

Three patients each had five operations, three patients each had four operations, three patients each had three operations, ten patients each had two operations, thirty-six patients each had one operation; that is, 19, or 35 per cent of the 55 patients, had two or more operations with a total of 56 operations on the 19 patients, an average of three. There were 36 patients who had single operations; some of these were single incisions of the orifice and others had two or three punches at one sitting.

Analysis of the type of prostate in these 55 cases showed it to be small in nine, large in 19, moderately enlarged in 27, or 46 of the 55 patients had definite rectal enlargement. Cystoscopic appearance of the orifice showed 15 small collar obstructions, 18 large collar obstructions, 16 lateral lobes and six contracted necks.

I shall not enumerate the results of these different patients on whom the repeated operations have been done; they have been previously reported. The substance of the situation is that whether the patients have had two, three, four or five operations, the results have been about the same, about 84 per cent have been cured of their obstruction. Six per cent of the patients of the larger type required later prostatectomy. These were the borderline cases and received no benefit from the punch. It is necessary to relate that in no instance was there any indication of scarring of the prostatic orifice following these previous punches, tissues were soft and pliable and the previous punches had in no way interfered with enucleation of the prostate at prostatectomy.

The chief factor in securing a result is to be convinced that the growth can be removed and to not become discouraged if one, two or three operations do not effect a cure; some of the best results have occurred after the fourth or fifth operation where the previous result had been imperfect. Many of these patients were extremely bad risks and those who could not tolerate major surgery with any degree of safety. There was no mortality following any of these operations. A number of these individuals had associated lesions such as central nerve conditions, stone, and diverticulum. It is, of course, at times risky to operate on the tabetic bladder but we have several very pleasant results after relieving the mechanical feature of obstruction. The combination of litholopaxy and punch operation has been a frequent one and the results have been excellent. If the diverticulum of the bladder is not too large and if it is emptying and not too severely infected, the relief of obstruction at the neck in an aged subject may be all that is necessary. It has certainly proven so in an analyses of our series of cases.

I have used this operation in 39 cases of carcinoma of the prostate with some very gratifying results. In quite a number of inoperable carcinomas with metastases who were suffering with extreme bladder discomfort, the punch operation has given complete restoration of urinary comfort with durability of two and one-half years in several instances. A number of these patients have had recurrence of obstruction and have required repeated operations to keep them comfortable; four of the patients have not been

relieved, usually because of the size of the obstruction and its rapid recurrence. At any rate, the operation offers the most pleasant method of handling the obstruction in the advanced carcinoma and is to be recommended instead of suprapubic drainage.

I wish to present also a child's punch, a miniature of the cautery apparatus. This instrument is designed for the congenital obstructions so frequently seen at the internal orifice of the bladder in babies and young children. These obstructive conditions are responsible for so many deleterious effects upon the kidneys and are creative of a very high mortality rate if left untreated.

Clinically these cases are the ones which appear as a protracted pyelitis or those with recurrent attacks of pyelitis. In such instances it is almost invariably true that obstruction with stasis is present somewhere along the urinary tract, most commonly the vesical end of the ureter and at the internal orifice of the bladder. It is this latter group that the child's punch will serve a definite purpose.

Under ordinary conditions these cases are surgically handled by suprapubic operation with resection of the internal vesical orifice. Proportionately this instrument is capable of removal of as much tissue as the large one extracts from the adult orifice and I believe will correct such defects in a large percentage of cases and should transplant open surgery to a great extent, thereby contributing to a better mortality rate.

Totalling the results obtained by this operation in all the types of obstruction in which it has been employed over a period of nine years, and it is found that 85 per cent have perfectly satisfactory results with this operation. It is a type of surgery which is not simply a mere cutting of the orifice which requires but a few minutes, but one which necessitates a great deal of attention and pains and knowledge of conditions. Many whose results were apparently imperfect have been completely cured by repeated operations. It is this familiarity of the orifice and the belief in the adaptability of the operation which in many instances insures a favorable outcome.

Often times the operation requires more time than prostatectomy. That is in cases where several operations are necessary for larger obstructions, but these are chiefly for bad surgical risks and usually done to protect against a mortality. There has never been a death in the 462 operations due to the operation. About a year ago a patient died on the eighth postoperative day, after a simple median bar excision. The patient obtained a complete relief, was feeling perfectly, had not had the slightest trouble from the operation. He fell dead of an old myocardial condition which had caused him many previous serious attacks. His death had absolutely nothing to do with the operation.

As a rule it saves the patients economically since the majority of patients are confined to the hospital only about a week and many attend to their business affairs in a short time after the operation.

Complications Have Been Rare.—The superficial burning has served to minimize hemorrhage. All patients have slight straining of the urine. There have been but a very few individuals who have caused any concern regarding hemorrhage. There were but 13 patients of the 462 operations who have attracted attention from hemorrhage. If the catheter is large and the eyes are free and care is given the first few hours one should expect very little trouble with bleeding. Our experience has been that one small clot occluding the eye of the catheter, creating spasm of the bladder, is the important factor in the causation of bleeding. It is important to see that the catheter is thoroughly fixed and that it does not have to be manipulated or reinserted. There has never been a hemorrhage sufficiently severe to require suprapubic cystostomy. There have only been five instances in which evacuation of the clots with the Bigelow evacuator was found necessary.

Chills and fever have occurred very rarely. In all there have been but 21 patients of the 462 who had reactions following the operation and practically all of these reactions occurred in patients who had previously suffered with pyelonephritis. They all subsided promptly under palliative treatment and in only one instance was drainage necessary.

Epididymitis has followed its usual tendency to make the postoperative course of urinary surgery unpleasant. It, however, has occurred less frequently than following the use of the indwelling catheter for prostatic drainage. Hence there is nothing specific about this operation in the promotion of epididymitis.

Pronounced sloughing has never occurred following the operation, nor have I ever seen incrustation of the orifice. The burning is superficial if done properly and should have no tendency to cause extensive reaction. Sections removed allow thorough microscopic study.

I have been asked many times if incontinence of urine had ever occurred following the operation. I have never seen incontinence and one should not expect it. We do not hesitate in prostatectomy to remove the prostatic urethra and insult the sphincter to an extreme degree, hence it should not be anticipated following a much more simple operation.

There has never been the slightest disturbance of the sexual apparatus. I have never seen a stricture of the urethra develop following the operation. This could only occur in instances where the current had not been disconnected and unnecessary injury done to the urethra itself.

The operation has been very valuable in hastening the closure of indolent suprapubic fistule and has been used for the removal of obstruction in five cases on whom suprapubic cystotomy had been done as the first stage operation, but the obstruction had not been removed for one reason or another, usually some serious complication. In all of these cases information was obtained from the surgeon who had done the operation that the prostate was large and that enucleation was thought unnecessary, but when they came under my observation the obstruction had shrunk to such a degree that the punch operation was entirely effective in not only closing the fistula, but in curing the obstruction.

In summarizing, allow me to suggest that the profession pay strict attention to the prostates of middle life and protect them from insidious infections. In so doing the majority of individuals may be spared any type of surgery and if early obstructions become manifest they should be dealt with promptly and not allowed to progress.

My results indicate that the operation can cure 85 per cent of obstructions to which it is applied.

The operation is simple of technic, perfectly visual, but requires proper interpretation of the orifice picture and patience in the execution of the after care. It necessitates diligent observation and attention after operation, but offers very little hazard to patients upon whom it is properly performed. Complications are few and mortality is negligible. The most important function which this phase of physical therapy has accomplished has been the solution of the nature of prostatic hypertrophy.

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DISCUSSION

DR. H. C. ROLNICK (Chicago, Illiois): Dr. Caulk's presentation has been so thorough and complete and covers the work that he himself has done for a period of ten years so well that there is very little for me to discuss except to emphasize a number of points.

I can truthfully say that Dr. Caulk's work is the outstanding work in urology in the last decade. I don't think his study of the bladder neck has just been to discover the etiology of the prostate, but we have gained more information about the pathology and the physiology of the bladder neck from his work than from anything else I know of; in fact, a good deal about the bladder neck is still a mystery to me. Furthermore, his work has stimulated others to make studies of the neurology and the physiology of the bladder and his associates and his co-workers in St. Louis have brought out a good deal that is of considerable value.

I have seen Dr. Caulk work and I am familiar with his instruments. The main point is that this instrument has a definite place in a large number of cases in which the bladder was opened or the prostate removed.

Prostatectomy is definitely indicated in many cases, but even at the best it is a formidable procedure, and the age of the men in whom we attempt prostatectomy is such that there is a definite mortality. The fact that 85 per cent of Dr. Caulk's cases of median bar contures and some of the mild types of prostatic hypertrophy get well and remain well, indicates that this procedure has a definite place.

While it is true that Dr. Caulk states that his work follows the work of Dr. Young and a few others, I think it is original in the sense that it develops something entirely new and the fact that with this instrument he can visualize the bladder neck and actually work under visualization and not with the blind operation that we had before. Furthermore, the procedure obviates hemorrhage and does not produce the scarring that we got with the old punch.

There are a few interesting points that he brought out that I think might be repeated. A good many cases of chronic infection of the prostate usually do not develop hypertrophy. In other words, a man who may have had a prostatitis in his young days, does not get a prostatic hypertrophy in a large percentage of cases when he gets old.

The value of the punch in carcinoma of the prostate (we have been in the habit of doing a cystotomy on these people who finally develop so much obstruction that they cannot void) brings this instrument particularly to the fore.

As in all things that are new and of value, a good many men try the instrument who have not had much experience with the study of the urethra or the bladder neck, men who are not acquainted with the instrument and men who operate without indications. It is for that reason that we may here and there have men who have gotten into difficulties in the use of this instrument. That develops with any type of new procedure. Unless there are definite indications followed and unless the man who uses the particular procedure knows what he is doing, he will have bad results. This condition is encountered in any form of therapy.

The fact that there is very little hazard to the patient is a thing that I think ought to be emphasized.

I haven't any more to say, except that I am very pleased to have been here to hear Dr. Caulk make his presentation.

PHYSICAL THERAPY IN THORACIC SURGERY*

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Physical therapy is of as great value in thoracic surgery as in surgery elsewhere in the body. *Heliotherapy* is important in the postoperative treatment of some chronic protracted debility diseases. *Exercise* in the form of both active and passive motion is of inestimable value in preventing some of the deformities which otherwise are very apt to develop in unilateral pleural or pulmonary disease. The destruction of tissue is in many instances best accomplished by means of *surgical diathermy*. In the severance of certain types of adhesions or in the actual incision of the lung itself the so-called *radio knife* has great advantages over the usual scissors or scalpel.

Inasmuch as the indications and contraindications for the use of heliotherapy and exercise in thoracic surgery are very similar to those in general surgery I will but dwell briefly with these forms of physical therapy allowing myself time to go into greater detail in the discussion of diathermy and the use of the radio knife.

HELIOTHERAPY

In my service heliotherapy is used routinely during the convalescence of cases of empyema, lung abscess, tuberculosis of the lungs and bronchiectasis. It is never given until the patient has become afebrile. It is stopped the moment any inflammatory recrudescence occurs. It is started in small doses and gradually increased. It is given for its general tonic effect. In one type of operation, that of cautery lobectomy, it is used for the mild local stimulating effect. The operation of cautery lobectomy consists of the piecemeal removal of a lobe of the lung by means of the actual cautery for such conditions as unilateral bronchiectasis, or multiple lung abscess confined to one lobe. Inasmuch as the lung itself is insensitive to pain its successive destruction of lung tissue is carried on without any anaesthesia. It has seemed to me that the granulation of the wound is improved when stimulated by daily exposures to the quartz lamp.

EXERCISE

Active and passive motion: In many unilateral diseases of the lungs and pleura there is marked tendency towards the development of scoliosis. This is due to postural habits developed during the period of sickness or to the actual pull of intrapleural adhesions. Exercises

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to overcome deformity should be started as soon as the patient's condition permits. Certain operations, such as those for chronic empyema, involve plastic operations of more or less magnitude to obliterate the infected pleural cavity. It is especially important that following such operations supervised exercise be given to avoid an unsightly posture. Due to the dramatic improvement following the operation of extrapleural thoracoplasty in selected cases of one sided pulmonary tuberculosis in patients otherwise hopelessly doomed, that operation is gaining widespread popularity. The operation consists in removing subperiostially the posterior portions of all ribs from the first to eleventh, inclusive. As a result the hemi-circumference of the chest is diminished and the underlying lung thus collapsed. Following this operation there is at first a habit scoliosis, a tendency to shoulder drop and a marked limitation of motion of the affected shoulder and arm. It is surprising how quickly all these conditions can be overcome by means of active and passive motion. A patient who has the advantage of carefully supervised exercise will leave the hospital walking erect and with so little shoulder drop that it is impossible to tell by observation which side was operated upon.

Surgical Diathermy

In certain tumors of the chest wall, surgical diathermy is the method of treatment par excellence. In this group, especially to be mentioned are local recurrences following amputation of breast for carcinoma, and those cases of tumor of the ribs, chest wall and pleura in which a massive sharp resection and subsequent closure are impossible.

The benefits of surgical diathermy over sharp resection are numerous. In those cases in which cachexia is present or metastases have developed, the same remarkable amelioration of the patient's condition occurs as has been noted from the coagulation of malignant tumors in other parts of the body.

The danger of pneumothorax and empyema in operating upon tumors of the chest wall arises from the fact that often it is necessary to enter the pleural space when the latter is not obliterated by adhesions. When the knife is used, pleural adhesions must be artificially produced as the first step of the operation. With surgical diathermy, however, it is possible to remove the tumor bit by bit at intervals of several days. As the parietal pleura is approached the reaction caused by the destruction of adjacent tissue usually stimulates the formation of adhesions and thus as a rule the tumor mass can be followed directly into the pleural space if necessary without fear of pneumothorax and concomittant empyema.

In tumors involving the periphery of the lung itself, surgical diathermy is of especial value. Removal of lung tissue by sharp dissection is a difficult procedure. The dangers of hemorrhage, pneumothorax and postoperative empyema are present. Removing the malignant lung tissue with surgical diathermy obviates these dangers just as the removal of suppurative lung tissue with the cautery as in cautery lobectomy obviates many of the dangers of pneumectomy.

It must not be supposed that surgical diathermy overcomes all the unpleasant sequelae to ablation of a lung tumor. Hemorrhage can occur. It is very much less apt to occur if a large surface active electrode and a low current are used instead of a small electrode with a high current. The greater the zone of coagulation produced, other things being equal, the less likely operative hemorrhage. A bronchial fistula will always result when one of the larger bronchi are opened, however, the leakage of air which follows sharp pneumectomy, due to the cautery of the very small and terminal bronchi is not present.

The surgical diathermy might as well be used for the removal of suppurative lung tissue as for the removal of tumor of the lung. I have, however, had no personal experience in this type of case, having followed the technic of Graham and performed the lobectomies with actual cautery.

Endothermic Knife (Radio Knife)

For actual incision of pulmonary tissue the endothermic knife is greatly to be preferred over sharp dissection in that it severs tissue without pressure. The consistency of the lung is such that it is extremely difficult to cut unless it is held taut either by natural adhesions or by some mechanical device such as forceps,

tweezers, etc. The pressure required, even when a very sharp knife is used, is often sufficient to tear the lung at the site of the adhesions or the site of fixation with forceps. With the endothermic knife on the other hand the lung tissue can be cut as it lies in situ without having to be drawn into the wound or stabilized. The radio knife does not produce complete hemostasis and bleeding is active whenever lung tissue is severed. However, the endothermic knife does close the very small vessels and the bleeding is reduced obviating the so-called capillary oozing. In incising lung tissue innumerable air spaces are open and often the bubbling of air from the cut surface is annoying. This bubbling is somewhat diminished when the radio knife is used instead of the scalpel.

Incision of the lung is necessary in order to drain deep seated lung abscesses, to remove foreign bodies, to excise pleural metastases in the case of endothelioma or to remove lacerated lung tissue following trauma. In all these conditions provided it is not necessary to give a pressure anesthesia the use of the radio knife is indicated.

There is an operation called pneumolysis in which adhesions between the visceral and parietal pleura, which fix the lung and thus prevent its collapse, are severed. This operation is used in cases of unilateral phthisis lung abscess in which artificial pneumothorax would ordinarily be indicated. The operation is of great value because in many instances it results in an excellent collapse of the lung and because it is less deforming and less radical than the alternative operation of extrapleural thoracoplasty. A partial artificial pneumothorax is done as a preliminary measure to accustom the patient to the change in intrathoracic pressure and then the operation is carried out under local anesthesia with no need for differential pressure. The pleural cavity is widely opened by means of a long intercostal incision. The adhesions are located and cut.

The radio knife in my experience has proved to be the ideal instrument for cutting the adhesions. The chief danger in the operation of open intrapleural pneumolysis lies in the spreading of infection following tearing of infected lung tissue at the site of the adhesions, or from opening the small encapsulated foci which sometimes are located in the adhesions themselves. By cutting without pressure and sealing the tissues as it cuts the radio knife thus lessens the likelihood of infection. For the same reason the likelihood of hemorrhage is reduced, although of course it is obvious that the large blood vessel running in the adhesions require ligation. Oozing from the denuded areas on the chest wall, when broad adhesions have been severed, can at times be controlled by sparking.

Ethylene-oxygen is the ideal general anesthesia for thoracic surgery and the fact that neither surgical diathermy nor the endothermy knife can be used in its presence forms the chief obstacle to their more general use.

Dr. Disraeli Kobak (Chicago, Illinois): I should like to make a few comments on Dr. Bettman's paper with reference to the physics of a form of diathermy called the "radio knife" in pulmonary surgery, and to disgress just a moment to emphasize the effect of the electric cutting current. The cutting knife is becoming more popular in surgery, and I am very glad to observe that it has sufficiently impressed such a rising surgeon as Bettman for him to employ it in such a difficult field. I have information that Dr. Cushing of Boston is now utilizing electrothermic measures in brain tumors.

There is quite a difference between ordinary cutting electrodes and the type of electroscalpel that I imagine Dr. Bettman utilizes or should utilize in these measures. We know that the electroscalpel promotes cutting or cleaving of tissues, produced by sustained or undamped oscillations of high-frequency current. When one cuts with an instrument of this type, he splits the protoplasmic material with very little coagulation taking place on either side of the incision, and only the very smallest capillaries are coagulated. If any prominent vessel is in the vicinity of this knife, bleeding ensues and we have the same difficulties as though we cut with an ordinary scalpel. On the other hand, we can produce a variation of these sustained oscillations by combining a damped or undamped current which gives us the difference of the combination of both currents. With this damping effect and with the decrease in the spark gap oscillations that is associated with the damping effect, pronounced coagulation without interference of its cutting properties is produced. Thus we have a peculiar type of incision, a definite incision. It cuts very easily, but not as easily as with the completely sustained oscillation, but it produces a more protective zone of coagulation, and with this measure we increase the protection of the tissues against bleeding. This type is the type of current that I imagine Dr. Bettman and Dr. Cushing use.

The usefulness of an instrument of this kind is far reaching. Not only can it be utilized for accessible malignancy, but it can be utilized in malignancy of the viscera, because one can cut, excise and seal all avenues of bleeding at the same time. Primary union takes place just as readily as though you cut with an ordinary scalpel. The operative field is entirely sterilized because of the excessive heat associated with the operation. Possibility of infection is therefore minimized.

I see great possibilities for this special current to be utilized in inaccessible malignancies. The surgeon should become more oriented with this measure. The difficulty in cancer surgery is not in the excision of the growth but in the inability to determine how much to excise.

Dr. Edwin N. Kime (Indianapolis, Indiana): I was interested in the work of Dr. Bettman, particularly in his work with dogs. I am especially interested in the manner in which he controls the respiration. Realizing, as we do, that a dog has no sounded mediastinum such as the human, I would appreciate if, in his closing discussion, he would give us a brief description of his method in his experimental work of maintaining respirations.

Dr. Ralph B. Bettman (Chicago): In closing the discussion of my paper, I simply want to add that, as Dr. Kobak pointed out, the current has to be damped, otherwise the knife will cut so sharply that we will get just as much hemorrhage as with the sharp scalpel, and the sealing off of the bits of lung tissue will not occur.

Our greatest difficulty in lung surgery, especially if we are going to use the cautery, is the anesthetic, and if this anesthetic is going to be available with a mortality as low or lower than ether or nitrous oxid, it will be a tremendous boon, because in lung surgery we are dealing with a particularly dangerous phenomenon, inasmuch as the ether or the nitrous oxid oxygen is often put into the lung with increased pressure in order to overcome the elasticity of the lung when it collapses, so that the patient can breathe. If we then make a hole in the lung, the anesthetic bubbles out. In the pleural cavity we so often have a cavity filled with a high percentage of ether vapor, which is extremely explosive, and if we can put the patient to sleep with this method, and then simply keep him living, keeping him aerated by putting ordinary air through his lungs, we will be able to use either the surgical diathermy or the endothermic knife in practically every pulmonary operation.

THE INNER DEVELOPMENT OF ROENTGENOLOGY*

PROFESSOR DR. GUIDO HOLZKNECHT

VIENNA

During the last hundred years medicine has made much progress of a far reaching importance. Yet that science has never been revolutionized so entirely, thoroughly, and in all its aspects, as it has been done by the invention of the roentgen rays. By it, medicine became enriched, improved and corrected. The use of roentgen rays in the practice of medicine developed and spread very fast and—one would like to say—tumultuously. At the present, not only roentgen specialists, but doctors of medicine in general and physicians, try to make the best use of it. They do so with various success and the ways to the best success are still a subject of discussion.

One may distinguish between two periods of development of roentgenology, viz., a shorter and a longer one. During the initial period, only the diagnosis of fractures and foreign bodies was possible, while in the second period roentgen diagnostics came to include diseases of the skeleton and pathological conditions of all the organs and groups of diseases, sometimes with, and at other times without, the use of contrasting devices. During that period, the roentgen therapeutics of the hyperproductive neoplastic and inflammatory groups of diseases developed.

Throughout the whole wide range of medicine, each kind of affection had to be studied thoroughly and in hundreds of individual cases. The development of a disease had to be observed clinically and by way of the x-rays as well as by the results of operations and dissections. Cases had to be studied anew pathologically and it was necessary to study the x-rays with regard to their physical-optical and biological nature. The findings were compiled, detail by detail, in countless scientific treatises. All nations took part in it. The names of those who were most successful in this study are known throughout the medical world.

During the first period, viz., that of fractures and foreign bodies, technic was difficult while diagnostics were easy. From the beginning of the second period, the technic becomes easier while diagnostics have grown more and more difficult. Nowadays, the technic of the apparatus is easy. Any physician may learn it within six months. However, the difficulty of diagnostics has increased to such an extent as to make it seem almost unsurmountable. It is wonderful how the findings of all those explorers in the realm of roentgenology are so congruous in spite of those men working separately at various places all over the world. However, it is easy enough to understand that many great differences of methods and results have developed, and therefore it is obvious that there are many erroneous ones among them. In spite of our proud enthusiasm for what has been achieved we have to admit that the present solution of the great problem is not satisfactory, neither with respect to the scientific exploitation of the actual possibilities nor regarding the practical use of the acquired knowledge. The reasons are evident; no one subject was able to be investigated exhaustingly, the minds of the scienitfic workers being prevented from concentrating by the fact that ever and anon there were discovered new methods, new organs and diseases, and new underlying problems. No practical worker had been able to confront the ever-growing scientific material and, at the same time, to pick out the essential matter and use all that proved to be correct.

This problem has been given serious thought for a long time all the world over. In Austria, as early as twenty years ago, my friend and fellow-worker, Kienbock, and myself—probably together with many others sharing our

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apprehension regarding the future—considered that the main technic of apparatus would be easily perfected by the physical, technical and industrial workers and, therefore, could be left to them. However, we realized the medical world would have to face a gigantic problem regarding diagnostics and therapeutics. How should we master diagnostically the thousands of pictures brought before us continuously by the roentgen apparatus? How should we understand and make use of the effects of the rays which, while powerful, yet mysterious and vascillating, kept on increasing continuously? Looking round for a solution of the problem we came to realize that the science of medicine itself and more so some other lines of scientific and practical endeavor taught us that there are two things needed for accomplishing a great task.

There is, first of all, division of labor, i. e., specialization. If the subject thus specialized in becomes too big further division and further specializing will become necessary. It is easy enough to master within a few years a fair amount of knowledge in a certain science provided the material to be mastered has been already prepared and well arranged; that is proved by everyday experience.

It is different, however, when we face a vast realm of a science of recent and fast development. In such a case, human life is too short to enable a man to master all the material and he will have to specialize. Of course, I am not speaking of inefficient specialization but I have in my mind only such specialization as endeavors to include also the material pertaining to kindred subjects. This principle, while acknowledged generally, has met with opposition in the realm of medical arts, and only recently it has come to be recognized by us, gradually gaining a foothold in consequence of the burden of overpowering scientific material. Many of our colleagues have applied it; thus we have, at present, in Vienna, many roentgenologists who, though being well versed in all branches of that science, yet specialize in some particular one. Thus the following particular departments have developed: The diagnostics of the cranium; it is by far the most difficult diagnostic realm, including the diseases of the eyes, ears, nose and nerves. Then we have the diagnostics of the jaws and teeth, the oesophagus, the heart and blood vessels, the rest of the mediastinum and the tumors of the thorax, of tuberculosis and the other pulmonary diseases, of the stomach and intestines, the urinary system, the female organs of reproduction, and of the system of bones and joints. In therapeutics, we have the neoplasms, the inflammations, the trophic-discrasial and the endocrine affections.

After some years, the value of the division of labor was shown there, too. Whoever limits his studies for a certain length of time to a certain subject can exhaust its depths and ascend its heights. In every sense, he will be able to become competent, he alone will be able to teach that subject with authority. All the rest will be able to learn from him, and from him only, as soon as all of us have adopted another principle, viz., that of communication; by which is meant to tell everybody what one believes to know, to show everybody what one has found, and to submit one's opinion to the unbiased judgment of one's fellows. A full and spontaneous communication, though not yet adopted throughout all the realms of human life, yet has always been acknowledged as an essential factor in scientific research and its results, nor can it be dispensed with in our special case. By means of mutually communicating our findings and discoveries, specialization raises every one to the height attainable at the time. Of course, specialization is not stereotyped but develops partly by further division, partly by combination. Apropos, if such a division of labor is necessary for success, then it is a matter of course that its extreme opposite, viz., the union of the general medical practice with the whole of roentgenology, must, at present, almost remain without result; nor has such a union gained a foothold with us.

The second thing needed for the completion of a great task is a sound foundation. Twenty years ago almost all the principal questions concerning the use of roentgen rays in medicine were as yet unanswered. In which way do the rays pass through the body and through the receptive and the strengthening layers and what is their effect on all those parts? With regard to the picture, what is caused by technical and photographical reason, what is normal, what is caused by the variations of age, of the constitu-

tion, what by disease? What is the general biological effect of the rays? What is the effect of the rays on normal and on pathological tissue? What shall we call the hundreds of new conditions? How shall we describe them, how define them Those general questions having to be treated scientifically, which means thoroughly, it proved necessary to consider the fundamental subjects of the whole realm and to study general roentgenology, viz., roentgen physics, roentgen anatomy and physiology, roentgen biology, then general roentgen diagnostics and roentgen therapeutics,* and finally the question how to properly adjust roentgenology to the medical arts in general. These subjects, requiring more sacrificial endeavor than the clinic departments, had also to be specially studied by those who were endowed with the necessary faculties to do so.

A sound foundation and specification could not be considered one after the other but had to be adopted both at the same time. Those who worked at the special departments had, from the very beginning and using their own experience, to take the initiative for the studying of the fundamental subjects and general roentgenology, and also had to take their part in the development of the latter department.

In trying to condense my statements I would speak on an order based on a sound foundation, specialization and communication. To speak of specialization only would not convey the right idea of what I mean.

This order has proved successful; nor must we be surprised at the fact for it is based on generally approved principles of organization. Where this order has not yet been established there may be discussions as to whether the general use made at present of the roentgen rays has contributed more of value or more of mistakes to the cause of special cases; however, where this order has been adopted it has proved overwhelmingly useful.**

Now let us approach the question of the generalization of this order. Its natural field appears to be that of the roentgen institutes in the general and sick-fund hospitals. I am not considering the universities all over the world. These are bound by tradition and therefore adapt themselves only slowly to new conditions. This order is now being applied to the praxis in private clinics of big cities. It will make headway as it is of essential value to the patient as well as to the physician. First it will find its way into the sick-fund institutes. The social-medical institutions under which we have to work furnish us the patients as well as the means and are likely to do so in future, too. These institutions rising from their crude original conditions by a gradual disentanglement from party politics quickly adjust themselves to every progressive movement. They are obliged to attain the minimum of duration of a disease and the best possible cure. For that reason, they have to look out for the most effective methods and the best ways in which those methods are put into practice. However, the whole of the medical world is, in a certain way, interested in that kind of specialization. They want teachers, especially for the difficult particular subjects. At least half of the thousands of physicians working in the field of roentgenology realize that they don't manage very well, but at the same time they can not find a place where they can get sufficient and thorough instruction.

The development towards that goal will not be a smooth one. Already we can notice a wrong interpretation of the idea of the division of labor as stated by me. Favored by tradition, a new movement is developing that says: Since you who devote yourselves exclusively to roentgenology divide the sphere of your work, it seems indicated that each department of medicine should claim its part and thus share in the division. In other words, this movement aims at

*I described these subjects in a pamphlet entitled "Our Relation to Roentgenology" (Springer Publishing Company, Vienna); in it there are treated all present-day opinions concerning the use of x-rays in medicine and their introduction into scientific research, teaching and practice. That pamphlet, then, contains the premises of this address, and I believe a knowledge of its contents is necessary to fully understand what I am saying today.

A partial translation of that pamphlet into English will be found in the volume for 1929 of "Methods and Problems of Medical Education," published by the Rockefeller Foundation, in which volume it appears under the title of "Roentgenology in Practice, Research and Teaching."

**In Vienna, there is the Institute of the author founded on that base; then there is an organization for the systematic training of physicians in Roentgenology and kindred subjects; there is, further, an Advisory Institute for Roentgen Technics, and an organization for medical-Roentgenological advice about submitted material.

the absorption of roentgenology by the other departments of medicine. This fate would be unavoidable if it served a purpose. However, already one can say that the opposite is true. The division of medicine into its various departments has originated from its own good reasons. It would seem only a coincidence if the subdivisions of roentgenology should coincide with those of medicine in general. However, that is not the case. Wherever, throughout the world, roentgenological subdivisions have arisen spontaneously by the union of homogenous, and the separation from heterogenous subjects, we see limitations and formations that are quite different from those indicated by the medical subjects. Only dermatology happens to fit into the divisions of roentgenology. However, this case must not be generalized for we see roentgen diagnostics without therapeutics and we see roentgen-therapeutics without diagnostics, both of them flourishing as separate fields of work, though, theoretically,, each requires the other for completion. On the other hand, of course, we do not see diagnostics of the stomach or the intestines being worked out especially with regard to internal medicine or in relation to surgery or neurology. Otological and rhinological roentgen-diagnostics do not progress anywhere unless there is, at the same time, made use of ophthalmological and neurological material, and vice versa. The reason is that roentgenologically positive cases of inflammatory and neoplastic affections of the cranium are not restricted by those technical limitations, not to speak of the foreign bodies and the traumas which come under our treatment. It is there that roentgenology, by inner necessity, unites subjects that otherwise, necessarily, would be separated. On the other hand, roentgenology tends towards division regarding inner medicine and surgery, provided we want to aim at the best possible results. There, too, it is true that man grows according to his higher aims. However, we are striving after the impossible if we imagine that the internistic or the surgical roentgenologist should be perfect in the diagnostics of the cranium, the thorax, the stomach, the intestines, the urogenital tract, and the diseases of the skeleton as well as in the roentgen therapeutics of the inflammatory, the neoplastic and the endocrine affections; in other words, that he should be perfect in all those particular subjects which we have said before came into prominence by the division of labor. Honor is due to those who strive after those goals that at present must seem beyond our human reach. Thus they maintain a high standard for our science. Progress, whatever may be our relation to it, will only be served slowly in that way. It demands division. So we see, on the one hand, roentgenology being divided by inner necessity making its lines of division pass through the great departments of medicine, while, on the other hand, the so-called small departments are united by it. Such a division of labor is necessary for efficient work, for real success and for attaining a perfect teaching authority by which may profit, in a narrower as well as in a wider sense, all those who want to improve their knowledge; on the other hand, it is a matter of course that the extreme opposite of that division, viz., the short-timed positions of roentgen assistants for the old departments have to stay sterile for the time being.

I have first reported about the inner development of roentgenology in Austria, and then shown in which direction that development was likely to point. I am well aware that many of you do not share my opinion in some of the points mentioned by me. However, I hope that you have been interested even in those things where you may disagree with me. Perhaps the distant future may show us a condition when our knowledge of this science will have been deepened, unified and ripened and we shall see our desire for simplification realized. However that may be, the external development will not be as violent as the internal one. The mills of men, too, grind slowly.

ELECTROTHERAPY IN OTOLARYNGOLOGY*

J. H. HESTER, M.D.

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In this paper I shall present some of the office methods in physical therapy as employed in ear, nose and throat diseases. I shall also speak of the results obtained.

First will be considered some of the diseases of the ear.

Eczema of the External Ear Canal.—Intractable cases not yielding to medical treatment sometimes respond to ultraviolet light from the water-cooled lamp. From six to eight treatments are usually necessary. The canal is cleaned with alcohol after which the ultraviolet is applied by means of a quartz rod for two minutes, increasing one minute each treatment thereafter.

Acute Otalagia.—In acute otalgia the use of ten per cent phenol and glycerine dropped in the ear and followed by about twenty minutes radiation with the infra-red lamp gives prompt relief. Sometimes several treatments have to be given, but the pain is relieved and complications usually averted.

Chronic Suppurative Otitis Media.—We first make a thorough examination of the nose and throat, and if any pathology is found, remove or correct the same. We then try to determine whether or not it is an operative or a treatment case. If the x-ray findings are negative and the perforation is large and located in or near the central portion of the drum, the discharge is mucopurulent in character and has no odor, it is fairly safe to say that the case will yield to treatment. The ordinary local treatments are given which result in a cure in a large number of these patients. However, there are a few that remain uncured. These are the ones which frequently yield to electrotherapy.

After removing all polypi, diseased bone, etc., and utilizing all other well known treatments, including electrotherapy, prompt results are obtained. First cleanse the ear canal thoroughly, then use radiant heat for twenty or thirty minutes at a time, every other day for ten treatments. If there is no improvement, use zinc ionization. After cleansing canal, irrigate with a warm zinc sulphate solution after which proceed with the treatment. The method is as follows: The positive pole of the galvanic current is attached to a zinc rod which is placed in a glass ear speculum filled with a zinc solution; the negative pole, to a moist sponge electrode held on the forehead or in the patient's hand. From two to three milliamperes of current are allowed to pass into the ear for about fifteen minutes. From three to five treatments are given a week apart before the ear will remain dry. Occasionally a dry ear results after one or two treatments.

Acute Mastoiditis—I feel that we have aborted a large number of mastoid abscesses by the use of gauze compresses saturated with equal parts of alcohol and boric acid solution placed over the ear. In addition to this we use radiant heat for twenty minutes each day. I do not have to operate on more than half as many mastoids as before this treatment was adopted.

Catarrhal Deafness—In treating catarrhal deafness with diathermy I have not had as good results as some of my colleagues report. I do not know whether it is due to incorrect technic, or for other reasons. I have corrected obstructions in the nose and removed tonsils where necessary before giving the treatments, but results have not been satisfactory. I used a small electrode over the mastoid and a large electrode in front of the opposite ear directing the current through the head, hoping to get the greatest heat where needed. The electrodes are made of block tin and placed over the part where desired, being sure that they fit the surface, or skin perfectly. A piece of rubber sponge is placed over the electrode which is held in position with an elastic bandage.

Acute, Subacute and Chronic Sinusitis—Radiant heat and diathermy have given splendid results in quite a few of the acute cases in which

*Read at the seventh annual meeting, American College of Physical Therapy, Chicago, Oct. 10, 1928.

it has been used. I believe, however, each case is a law unto itself and should be so handled.

Diathermy is the most beneficial energy in the treatment of this condition, because it produces drainage, relieves congestion and stasis, relaxes muscle spasm and promotes absorption by increasing the blood supply. This creates an adequate ventilation of the sinus openings and so stimulates the involved mucosa to return to a normal condition. Most of the acute cases respond promptly, but the subacute and chronic cases do not respond as readily. After operation in the nose to relieve obstruction and facilitate drainage diathermy or radiant heat is very beneficial. In severe cases of acute sinusitis the infra-red lamp is almost indispensable. A solution of one per cent of cocain is sprayed into the nose and the patient sits before the lamp for twenty minutes. This establishes drainage of the sinuses after which a thorough spraying clears the cavities. This treatment is repeated for several days. In the presence of an acute infection the writer does not believe any kind of surgery is advisable. A deflected septum is, however, frequently the cause of an obstruction to the sinuses, and after the acute condition has passed a submucous resection should be done. I do not believe any electrical method can surpass the submucous resection for pathological conditions involving the septum. We have not used zinc ionization on the nasal mucosa, but believe it should be effective in selected cases.

Hay Fever—Quite a number of so-called hay fever patients can be relieved if the necessary surgery is done in the nose; however, a true case of hay fever cannot be relieved this way. Ultraviolet light is sometimes of definite advantage. The water-cooled light has no effect on the pollen which is causing the condition. It is, however, known that it has a good germicidal effect and by applying the light to the nasal mucous membrane we relieve the membrane of its normal work in taking care of the bacteria which sticks to it in breathing. In doing this we allow it to give more attention to the handling of the pollen. The membranes tolerate large doses of ultraviolet as compared with the mouth and throat. You may start with one-half minute, rapidly increasing up to three minutes for each exposure, depending upon the reaction obtained. It is well to precede the treatment by thoroughly cleansing the surface. In case the membranes are congested shrinkage can be effected by spraying with one per cent solution of cocain. General body irradiations with the air-cooled quartz lamp should be employed as an auxiliary treatment.

Acute Pharyngitis—When not due to a sinusitis or a tonsillitis, it is best treated with ultraviolet, using a special applicator, beginning with one-half minute and increasing to tolerance. Diathermy applied to the neck may also be used to advantage.

Acute Laryngitis—Acute laryngitis, if not complicated with tonsillitis or sinusitis, is best treated with ultraviolet using a special laryngeal applicator. All applications to the mucous membrane of the throat with ultraviolet should be started with half-minute doses, increasing the exposure as the patient may tolerate it. The throat seems to be hypersensitive to ultraviolet radiation.

Tubercular Laryngitis is best treated with the water and air-cooled lamps combined. This is, in my opinion, the best treatment known today for this condition.

Acute Tonsillitis—This condition can be benefited with the ultraviolet light, but all infected tonsils should be removed surgically as soon as the acute condition subsides. I do not give much credence to the dessication or coagulation of tonsils except in the known bleeder, where operation would be very hazardous.

Papillomas—Papillomas about the nose and face can best be removed with dessication. I focus the spark at first around the outer edge of the growth; by so doing it seems to anesthetize the part and after which the tumor can be desiccated without pain of any consequence. The number of treatments will depend on the size of the growth. I might add that all the above conditions would be materially benefited if given body radiations with the air-cooled ultraviolet, for their alterative and tonic effects.

Due credit should be given to the men who have contributed so much to this well known specialty. A few of their names are as follows: Hollender, Cottle, Linn, Brooke, Novak, and others, too numerous to mention.

I do not believe physical therapy is a cure-all, but if used at the proper time, in the proper way and in selected cases, it is a great adjunct in the practice of medicine, and particularly in the specialty of otolaryngology.

DISCUSSION

Dr. Frank J. Novak, Jr. (Chicago, Ill.): I am very pleased to hear the rational and conservative presentation of this subject by Dr. Hester. There are only a few points that I wish to take up.

In regard to chronic suppurative otitis media, Dr. Hester said that in the resistant and stubborn cases he uses physical therapy. I feel that not only the stubborn cases should be treated by physical therapy, but all other cases of chronic suppurative otitis media. I believe you will get better results than you will by any other methods.

In regard to acute mastoiditis and the use of radiant heat, I wonder whether the use of radiant heat or any other physiotherapeutic measure has reduced the number of operations for acute mastoiditis. I think that there is a tendency toward greater conservatism in the operation on the mastoid. I believe, in general, that there are fewer operations being done for mastoiditis now than fifteen years ago. There are a certain number of cases that get well regardless of the therapy. I believe the general tendency among otologists is to be considerably more conservative than they have been in the past.

The use of radiant heat, of course, is of inestimable value in the relief of pain.

In regard to catarrhal deafness, I agree with the doctor entirely that the results which he has obtained and the results which I have gotten and other men I know of are disappointing. That is not to be wondered at when you consider that many of the cases, practically all the cases of so-called catarrhal otitis media or catarrhal deafness are due to a pathology which nothing can influence.

As you know from some work of the Vienna otologists, the mastoid undergoes certain changes. Those changes are inevitable; they start at birth and continue. The mastoid is filled up at birth; it is filled up with a connective tissue, an embryonic connective tissue. If that tissue is absorbed normally we have the normal fenestration of the mastoid; if something interferes with the fenestration, we have the sclerotic mastoid. It is the bulk of these sclerotic mastoids that are the bases for much of this so-called catarrhal deafness. The changes which occur in the mastoid are the changes which occur in the middle ear. They are extensive changes and there is very little that can be done to influence the processes which have taken place in the course of the lifetime of an individual.

In regard to sinus infections the doctor said this: "The use of radiant heat is almost indispensable." I should like to go him one better and say it is indispensable. We know nothing that is of so great value or of equal value than radiant heat in acute sinus diseases, both from the standpoint of relief of pain and for actual definite therapeutic results.

Dr. E. G. Lynn (Des Moines, Ia.): I should like first to agree with Dr. Hester and with Dr. Novak in regard to middle ear impairments and results that may be obtained in caring for them. I cannot, however, feel the disappointment in the almost uniformity felt by others. I believe they do not deliver immediately to the parts impaired in these cases the desired therapeutic influence. I am quite convinced that the influence delivered to the parts impaired does favorably influence many of the cases, not those essentially chronic, but those with a chronic base upon which acute conditions have been building.

In my experience those are materially benefited by the delivery to the external canal and the drumhead of the therapeutic influences that we endeavor to deliver there. I believe that applying the diathermy current by means of some fluid, filling the external canal, then after the parts are generally heated up by whatever external applicators may be used, bringing through a small electrode down to the parts impaired to the drum-head, that the influence is very likely to be materially better. The results will be more uniformly helpful and we will be encouraged by the measures adopted.

Dr. M. H. Cottle (Chicago, Ill.): In discussing the paper I should like to ask Dr. Hester whether he would care to make a statement, roughly, as to the statistical results of his treatments in hay fever patients. I should like to have that answered before I discuss the paper.

Dr. J. H. Hester: As I said at the close of my paper, electrotherapy is not a cure-all, but the majority of hay fever patients that we have treated with this method have improved considerably and especially during the season. We give them one or two treatments a week at the beginning. They probably would not return again for three or four weeks, and some of them not at all. We have given them as high as ten treatments in one season with fairly good results in most of the cases.

Dr. M. H. Cottle: I shall limit my remarks to the hay fever problem.

First, I wish to say that this year all our hay fever patients who were sensitive to ragweed or goldenrod were made materially worse by the use of ultraviolet in the nose. From experience that we have not observed heretofore, but which I definitely state is occurring right here in Chicago, anyway, people who showed skin tests at least to prevalent pollens were not helped by general body ultraviolet; they were, as I said before, made worse by the introduction of ultraviolet in the nose with a quartz applicator. They were not so much disturbed if the ultraviolet was put in by the ordinary speculum, but they were not materially benefited. They were not benefited by general ultraviolet, calcium or thyroid extract, or any of those measures. They received the greatest amount of benefit from anything which desensitized the nose, and as many were

helped by topical application of trichloracetic acid as by anything else.

In the first part of the season I coagulated the tip of the inferior turbinate every once in a while. For example, we have as you look into the nose on both sides the tips of the superior and inferior turbinates. A needle may be pushed down into one spot and that seems to control the patient sometimes for a week or two without symptoms. Then towards the end of the season when we suppressed the hay fever by these topical applications a good number of patients developed asthmatic symptoms with the result that we had the asthma to treat in addition to the hay fever. We were quite discouraged.

Dr. H. C. Payne (Philo, Ohio): May I ask just a question? What is the technic of the application of the heat in sinusitis?

Dr. Delos W. Hogue (Springfield, Ohio): In regard to hay fever, last season I treated a number of patients who were sensitive to ragweed and relieved them completely during the season with about two treatments a week, but this year one of those patients came to me who was not relieved. I can say that for Dr. Cottle's information with regard to ultraviolet, but I relieved a number of others this year. One patient particularly was completely relieved last year and did not respond at all to the ultraviolet treatment. These patients were sensitive to ragweed and other pollens.

With reference to sinusitis, I want to agree with Dr. Hester in regard to drainage of the sinuses by the removal of the obstructions in the septum, those high-up obstructions which so many of our men sometimes overlook. We must get drainage.

I also wish to say that I have been able to sterilize the antrum after draining, making a large enough internasal opening to pass the quartz rod, giving a treatment for about three minutes. I found that very beneficial in some of those rather stubborn cases of antra infection.

Dr. Reese (Knoxville, Tenn): I want to speak in regard to hay fever. My results have been similar to Dr. Hester's.

The first year that I had the quartz light I thought I had a cure-all for hay fever cases. It seemed that practically all of them did respond to the treatment, but since then I have found some that do not respond. I don't know of any cases that I have treated which have been made worse. Dr. Cottle's experience is very unusual. I don't know how to explain it. He has not explained whether it was a typical climatic condition you had in Chicago this year, or whether there is something wrong with his machine, or what. I cannot understand why he should make every one of them worse. That is something very unusual.

Dr. Smooter (Indianapolis, Ind.): I should like to refer to what Dr. Cottle said. I certainly should like to get some cure or relief for hay fever.

Last year we grouped the various serums and gave general body radiations and intranasal treatments with the ultraviolet and apparently got definite results. Using the same treatment this year, with the exception of one patient, every patient got worse. I cannot account for it.

I treated six patients that I treated last year. One of the six, my son, got better; the rest of them were distinctly worse than the previous year. The new ones I treated made the remark that they did not see any benefit from the treatment whatsoever. They got along just as well with a little pollenated treatment during the season such as they took in previous years.

I wonder if there is anyone here who might explain that. As I said, six patients whom I treated the previous year got along very well, but when given practically a similar treatment this year they were worse.

Dr. E. G. Linn (Des Moines, Ia.): Dr. Cottle, did you in your work this year use nitrate of silver? I believe I got some relief with it this year.

Dr. F. Peter Herman (West Palm Beach, Fla.): I have not been treating hay fever after this fashion, but I believe it is a bacteriological fact that certain diseases, or the bacteria causing these diseases, run in a cycle as to their potency. Could that not be possible with our various pollens; in other words, through propagation, year after year, they either go down or up in their potent effects? I should like to place that before the society.

Chairman Dillinger: I do not believe that there is a normal nose that ever had hay fever. There is either sinus trouble or an infection which makes the soil ready for the pollen which simply adds to the excitement, plus the lowered vitality of the patient or the lack of elimination of that patient.

My most outstanding case of hay fever and asthma was greatly aggravated when I was trying ultraviolet treatments. The patient had been a sufferer yearly for fifteen years, and the worst two weeks she ever had were after my treatments. She had a lowered vitality and was a very thin, delicate woman. I cut her off from all treatments and tried ephedrin; I haven't much use for that and less for vaccine. I placed her on a rational diet, with good elimination of the bowels and kidneys, and a sweat occasionally as she could stand it. She had been going to the Adirondacks which seemed to give her a little benefit, for five years. After my treatment she went back and it didn't do her a bit of good. This past year she went there and has been better than she had ever been in ten years. She took no medicine. She watched her diet, drinking much water, taking a little salts occasionally for a watery stool and a few occasional sweats. The woman has sinus trouble and will not submit to operation.

Dr. George W. Brown (Chicago, Ill.): With regard to laryngeal tuberculosis, you spoke of relief obtained from the ultraviolet. It would seem that anything that can relieve this unfortunate condition would be very readily accepted, but my experience with laryngeal tuberculosis has been that in the acute, exudative type of tuberculosis with laryngeal complication, the systemic use of ultraviolet together with the local use in the throat of the ultraviolet, generally made the pa-

tients distinctly worse. However, on the other hand, in the more slow, chronic, fibrous forms of pulmonary tuberculosis of the throat, relief was obtained through very cautious use of the systemic application, together with ultraviolet irradiation of the throat. One thing was noticed: The pain, the euphorial hoarseness and pain in the ear that sometimes aggravates patients were more distinctly relieved by the use of the cautery in the destructive lesions in the larynx. After the temperature came down to 99, not going above 100 in the afternoon, the systemic application of the ultraviolet, very cautiously together with the irradiation of the throat, seemed to improve the whole picture.

In order to properly credit the use of ultraviolet an attempt should be made to classify the type of tuberculosis in which it has proven beneficial in large series of cases. I feel very strongly that in these acute exudative types no attempt should be made to use the ultraviolet except very cautiously. These cases are rapidly progressive and local treatment frequently seems to aggravate it. In the more slowly fibrotic forms, relief can be expected.

Dr. Maurice Weisblum (Philadelphia, Pa.): In citing our experiences with hay fever in Philadelphia, I am sorry to say that we have never gotten any good results. The ultraviolet ray has rarely given any improvement in any of the hay fever patients that we treated.

Referring to the statement of Dr. Brown regarding tuberculous ulceration of the larynx or the mouth, I wish to say that we get very good results in those cases, whether acute, chronic or fibrous. Perhaps Dr. Brown has found the ulceration covered with a great deal of discharge, and if the surface is covered with any secretion, naturally the ultraviolet ray will not penetrate and will not produce any favorable results.

I don't believe we have had a case where the pain was increased after the treatment and we have given the wrong treatment. We start out with six or eight-minute applications direct to the ulceration, but we first clean the surface of the ulcer. We have not given many body treatments, but we usually give local applications to the clean ulcer, and invariably we have gotten the relief of pain. In fact, we think we have one case cured now. We treated this case at the Jewish Hospital in Philadelphia with applications two or three times a week and increased them to fifteen minutes per treatment.

Dr. J. H. Hester (Louisville, Ky.): In regard to what Dr. Novak said in treating all the chronic suppurative otitis cases, I am going to take his advice. I believe, too, we will get better results.

In regard to Dr. Cottle's question, again I want to say that I have not had much experience in treating hay fever. I have been treating it for two years now and have never had the skin tests made. The general men in our city do practically all the hay fever work and give these tests in the regular routine treatment.

However, there are a number of them who will come to the throat men to get their advice, and I have given this treatment to the cases which have applied to me for treatment. I did not take the time to go into all these different tests to know what the pollen was in each individual case, but I do know that I got results. In the large majority of cases they were benefited; I don't say they are cured. I don't think any of them are cured, that is, any of the true hay fever cases.

I don't exactly agree with Dr. Dillinger in that all cases are due to some sinus infection. I used to think the same thing, but I have cleared up the sinuses to my satisfaction in some of these hay fever cases and the hay fever condition did not improve at all. Had I gotten any relief at all I should still think the same as Dr. Dillinger.

In regard to the technic used in treatment of acute sinuses with the radiant heat, as I stated before, the patient is placed before the radiant heat after having sprayed the nose with a one per cent cocaine solution. We place them within ten or twelve inches of the radiant heat and let them sit there in front of that heat for about fifteen to thirty minutes.

There is one other thing in regard to laryngeal tuberculosis, which I want to mention. We don't treat many of these cases, of course, and especially in the acute stages that Dr. Brown mentioned with temperature. We send them to the sanitorium right away. The cases that are up and about, the chronics who have been labeled tubercular patients, are the cases which come to us for treatment, and we get, I think, splendid results.

PHYSICAL THERAPY CLINICS

X-RAY TREATMENT OF SUPERFICIAL NEOPLASMS*

W. E. PENNINGTON, M.D.

INDIANAPOLIS, IND.

The treatment of neoplasms has been discussed very frequently in the past and the history of treatment has been very ably presented by different authors. The writer asks your indulgence in his personal views regarding treatment of superficial neoplasms.

The success of roentgen treatment is very dependent upon the accuracy of the dose; the rapidity of the growth; the position of the lesion; the degree of inflammatory structures about the growth; the previous treatment and the physical condition of the patient.

There has been much discussion about fractional and massive doses. It is very evident that fractional doses are much the safer and should be used where the lesion has become deep and where there is considerable inflammatory tissue. My experience has been that fractional doses are very hard to control because of a marked cumulative effect on some patients and lack of it on others. If a dose is given once each week some of the patients recover from the results of the doses very quickly while others show a delayed reaction and will therefore get a cumulative effect from each of the fractional doses.

I find the massive dose most efficacious in most all superficial lesions; however, it is very dangerous when milliampere fluctuations occur. It is very easy to demonstrate that errors in dosage occur during continued line fluctuation. If milliamperage ranges from 4 to 6 in air cooled tube or from 27 to 32 in water cooled tube, error in the dosage may range from 10 to 30 per cent. These facts make it very imperative that the flow of current be controlled accurately.

We are not always able to determine the type of lesion, therefore, the dosage must be a result of personal judgment. Small lesions do not need as much radiation as large ones; however, it is advisable to give as large a dose as the particular locality will permit.

The rapidity of the growth must be considered when giving a prognosis. If the growth is very rapid, the treatment must be very vigorous to depress the proliferative cancer cells. If the lesion is of a long standing, it is not imperative to stop it quickly. The fast growing lesion is more prone to metastasize which makes it more necessary to treat the glands in the surrounding structures to prevent metastasis.

The position of the lesion also controls the amount of dosage that may be given. Where the blood supply is excellent and there is an absence of tendons and bony structures immediately underneath, large doses may be given; however, on the back of the foot and the back of the hand much caution is necessary to prevent injury to the underlying structures. Lesions about the eye respond very quickly to large doses. We are compelled to exercise cau-

Fig. 1. Epithelioma on the right side of the nose and involving the eyelid. Before and after treatment.

*Read at the seventh annual meeting, American College of Physical Therapy, Chicago, Oct. 10, 1928.

Fig. 2. Epithelioma of the left cheek near the angle of the mouth. Before and after treatment.

Fig. 3. Epithelioma of the lower lip. Before and after treatment.

tion on account of possible damage to the retina; however, I have been compelled to administer large doses to the eye lids and have never yet seen any impairment of the retina. Large unfiltered doses will always cause a marked conjunctivitis.

Radiation offers excellent advantages because there is a maximum conservation of tissues about the site of the lesion.

Lesions on the lip which are of a long standing are practically always potential cancers and should be treated as such. This likewise applies to the tongue and the inside of the oral cavity. It is very important to conserve all the structure possible, I therefore apply only the x-ray to these lesions; this dose does not destroy any of the underlying structure and when applied in a large single dose causes the minimum amount of scarring. Treatment of the inside of the mouth is usually done through a short rectal speculum of sufficient size. By this means we are amply able to protect all the surrounding parts.

The pigmented wart, which is distributed over all parts of the body, always presents a serious problem as soon as it shows any malignant degeneration. I usually give about twice the erythema dose over an area of about six inches in diameter; then I cut a mask about the size of the melanotic growth and give it about four times the erythema dose. This administers a lethal effect for about three-fourths of an inch deep. If there is any suspicion that metastasis may occur in any group of glands that drain the affected area, very vigorous treatment (deep therapy) is applied to the suspicious zone.

The rapidity of the growth must also be considered when beginning treatment. If the lesion is very slow growing we are permitted to take our time in administering treatment. If the lesion is rapid in its growth it is very evident that curative measures must be administered very quickly. When surrounding tissues are infiltrated it usually presents an impossible task. Prolonged fractional treatments usually have a tendency to irritate any growth of large magnitude. It has been my experience that normal tissues will tolerate more x-ray treatment than neoplastic tissue and for this reason my usual choice is a massive dose.

Another condition which complicates our treatment is that of an inflammatory zone. It

Fig. 4. Epithelioma of the right cheek. Before and after treatment.

Fig. 5. Epithelioma of the left cheek in the parotid region. Before and after treatment.

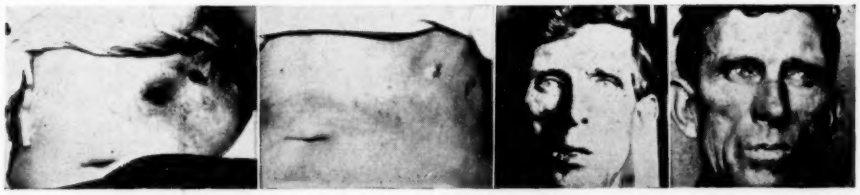

Fig. 6. Epithelioma of the left upper portion of the abdomen. Before and after treatment.

Fig. 7. Epithelioma of the right half of the lower lip. Before and after treatment.

is impossible for anyone to estimate the degree of reaction of an inflammatory zone, which makes it almost impossible to estimate the amount of x-ray dosage which can be given under the above circumstances. Frequently patients present themselves for treatment after they have applied many and countless irritants. Inflammatory areas do not tolerate x-ray treatment as well as normal skin areas. There is a marked tendency to fibrosis when an inflammatory area is treated by the x-ray and malignant structure seems to metastasize through the areas very quickly.

Previous treatment with fractional doses of x-ray, radium or pastes also complicate our efforts to give a proper massive dose. It is generally considered that any previous treatment that has failed, makes our success more difficult.

The physical condition of the patient also has a bearing on the ultimate results. It is the general experience that lesions on very weak and cachetic patients respond quickly to x-ray treatment, however, these patients usually go down quickly and add another case to our failures. The more vigorous the patient the slower they are to respond to treatment, however, the ultimate success is assured in a high per cent of the well nourished cases.

All of our x-ray treatment is governed by our *desired* results. No one would dare to burn a patient to a degree of permanent impairment. It is our desire always to remain within limits that are safe. If surrounding or underlying structures are in danger of permanent injury, we must vary our treatment and stay within safe limits. X-ray erythemas that follow a single treatment always heal quicker than x-ray erythemas caused by fractional doses. Many of our unpleasant results have arisen from the patient becoming frightened and consulting someone who is not familiar with an x-ray dermititis. I personally know of an instance of a nurse who was given an erythema dose; she became frightened and consulted her family doctor who immediately applied solutions and ointments of picric acid. The area became inflamed and sloughed and forced her to bed for about three months. X-ray burns should never be treated with any irritating substance. Cold cream should be freely applied; the lesion should be frequently cleansed and quartz light treatment may be used in moderate quantity.

Fig. 8. Epithelioma of the right half of the forehead. Before and after treatment.

Fig. 9. Epithelioma of the right side of the neck near the hair line. Before and after treatment.

In conclusion I wish to state without reservation that my advice to an individual in treating neoplasms is, always use the method that insures success. I have been able to produce a very high per cent of cures by means of x-ray and have done this with very slight destruction of tissue and with excellent cosmetic results.

Dr. Disraeli Kobak (Chicago, IIllinois): I was a very appreciative auditor to Dr. Pennington's paper, and I am certain that if anyone follows the technic that he has given us, our results should be much better than they have been heretofore. At the present time, in the excision or the coagulation of accessible cancers, we have followed up these operations by radiotherapy, and our results have been far better in cases where we have utilized both measures.

Dr. Edwin N. Kime (Indianapolis, Ind.): With regard to Dr. Pennington's work, I value it very highly. Dr. Pennington has x-rayed a number of cases for me, particularly of the neck, and, rather in disagreement with the remarks of the last speaker, whom I honor very highly, our results so far in cancer of the lip have been very good. However, there is no question but that it might be best to resect all the lymph bearing tissues of the neck in cases which are particularly known to be radiation resistant.

Dr. W. E. Pennington (Indianapolis, Indiana): I stated in my paper that I always advocated the method that produced the results, and I still feel that way about it. If one person can produce results by one method, he knows that method, and I would advise him to go ahead and do it.

With regard to block dissection, I know that is good and I know that it has brought results. If a person is going to have a block dissection, I would advise him also to have some therapy in the same region afterward, because it would make it doubly safe. When I treat these sublingual and submaxillary regions, I treat them just as hard as I treat some of these lesions I showed you, and I get quite a skin reaction, always; I never stop short of a severe reaction. The result is that I believe I am showing excellent results.

Dr. Willmoth: What voltage do you use?

Dr. Pennington: I use 105 k. v. to a certain point until I get a severe reaction from it, with about two millimeters of aluminum, as a rule.

Dr. Willmoth: What distance?

Dr. Pennington: Twenty inch distance, 30 milliamperes, water-cooled. After I have gotten rid of that reaction on the low voltage, I then give as much high voltage as I think the patient can stand, up to an erythema, so I don't hesitate to give them all that I think they can stand.

EDITORIAL

ARCHIVES OF PHYSICAL THERAPY, X-RAY, RADIUM

CLINICAL CONGRESS AND THE EIGHTH ANNUAL MEETING OF THE AMERICAN COLLEGE OF PHYSICAL THERAPY, NOVEMBER 5, 6 AND 7, 1929, HOTEL SHERMAN, CHICAGO.

Chicago has again been selected as the annual meeting place for the clinical congress of physical therapy of the American College of Physical Therapy. The concensus of opinion of the many representatives who have attended the sessions in the past few years, is that Chicago offers the most attractive features for a large medical gathering. Convention facilities are unsurpassed. Chicago as a medical center needs no apology. The experience of those who have attended any of the previous conventions speaks well for a highly successful 1929 Clinical Congress.

One of the novel features to be inaugurated this year is the clinical part of the program. One-half of each day will be devoted to a variety of clinics in the sections in medicine, surgery and allied specialties, and eye, ear, nose and throat. As in the past, there will also be a joint meeting of all sections for the presentation of numerous addresses of interest to all physicians irrespective of their specialties. Education in physical therapy will be thoroughly stressed, as the time has come when this phase of the subject must be given due emphasis by an organization such as the American College of Physical Therapy. Scientific papers, clinical addresses, demonstrations of technic, and scientific and technical exhibits will comprise the remainder of a scientific program which merits the attention of all those interested in the newer fields of medicine. Attendance at the congress is not limited to the fellows of the college, as all duly licensed physicians, their technicians and assistants, properly sponsored, are cordially invited to attend all the sessions.

Program and other information may be obtained by writing to the Executive Offices, American College of Physical Therapy, Suite 716-30 N. Michigan Avenue, Chicago, Illinois.

EXAMINATION OF TECHNICIANS FOR CERTIFICATION BY TECHNICIANS' BUREAU, AMERICAN COLLEGE OF PHYSICAL THERAPY

For the past two years the Technicians' Bureau of the American College of Physical Therapy has conducted a qualifying examination for the purpose of certificating technicians who are qualified in physical therapy as non-medical assistants. A large number of technicians have taken these examinations and a good number have already registered for this year's examination which will be conducted on Friday, November 8th, at the Hotel Sherman.

Technicians contemplating attendance at the annual session and registering for the examination are urged to apply at once. A technician must show proper educational qualifications before being permitted to the examination. No applicant is accepted who has been in the work less than one year, unless the course of instruction has been under personal supervision of prominent physicians who will vouch for the nature of the work and the readiness of the applicant to be examined.

Fellows of the college are urged to encourage their assistants to take this examination. The ground covered includes a theoretical and practical consideration of light thermotherapy, electricity: lo wand high tension currents, conduct, ethics and such practical phases of the subject with which a good technician should be acquainted. A fee of ten dollars must accompany the application. This fee is payable only once and in the event of failure applicant is permitted to take a second examination within one year without charge. No fee is made for the certificate. Send for further information and application forms to:

Technicians Bureau,
American College of Physical Therapy,
Suite 716-30 N. Michigan Avenue,

American College of Physical Therapy
Chicago, Nov. 4, 5, 6, 7.
Hotel Sherman

Preliminary Program

Clinics

Section on Eye, Ear, Nose and Throat

	MONDAY, NOV. 4	TUESDAY, NOV. 5,	THURSDAY, NOV. 7
9:00 to 10:30	*Physical Therapy in Ear, Nose and Throat Diseases: Scope and Limitations*— F. G. WAHRER, M.D., Marshalltown, Iowa.	*The Filling of Sinuses by the Displacement Method*— ARTHUR W. PROETZ, M.D., St. Louis, Mo.	*Chronic Suppurative Otitis Media*— M. H. COTTLE, M.D., Chicago.
10:45 to 12:15	*Middle Ear Deafness*— ELLIS G. LINN, M.D., Des Moines, Iowa.	*Rhinologic Diseases—Physical Therapeutic Methods*— A. R. HOLLENDER, M.D., Chicago, Ill.	*Malignant Diseases of the Ear, Nose and Throat*— T. C. GALLOWAY, M.D., Evanston, Ill.

Section on Surgery (and the Surgical Specialties)

9:00	MONDAY, NOV. 4	TUESDAY, NOV. 5	THURSDAY, NOV. 7
to 10:30	*Gynecologic Diseases*— J. E. G. WADDINGTON, M.D., Detroit, Mich.	*Urologic Diseases*— GUSTAV KOLISCHER, M.D., Chicago.	*Pulmonary Surgery*— RALPH B. BETTMAN, M.D., Chicago.
10:45 to 12:15	*Accessible Neoplasms*— D. KOBAK, M.D., Chicago, Ill.	*Industrial Surgery*— FRANK H. WALKE, M.D., Shreveport, La.	*X-Ray and Radium Therapy*— A. F. TYLER, M.D., Omaha, Nebr.

Section on Medicine (and the Medical Specialties)

9:00	MONDAY, NOV. 4	TUESDAY, NOV. 5	THURSDAY, NOV. 7
to 10:30	*X-ray Therapy—Methods of Dosage, Biological Laws and Treatment Methods*— ALBERT BACHEM, Ph.D., Chicago.	*Arthritis*— J. C. ELSOM, M.D., Madison, Wis.	*Dermatological Diseases*— A. E. SCHILLER, M.D., Detroit, Mich.
10:45 to 12:15	*Pneumonia and Chest Diseases*— GAGE CLEMENT, M.D., Duluth, Minn.	*Hypertension*— CURRAN POPE, M.D., Louisville, Ky.	*Low Tension Currents*— J. U. GIESEY, M.D., Salt Lake City, Utah.

Program

SECTION ON MEDICINE, DIAGNOSIS, PEDIATRICS, NEUROLOGY, ENDOCRINOLOGY

Monday Afternoon, November 4, 1929

Further Observations on Diathermy in Pneumonia.
F. B. FREELAND, M.D., Portland, Ore.
Discussion opened by Gage Clement, M.D., Duluth, Minn.

Diathermia and Other Physical Agents in Treatment of Pneumonia and its Sequelae.
ADOLPH A. LILIEN, M.D., New York City.
Discussion opened by Damien St. Pierre ,M.D., Windsor, Ont., Canada, and Lloyd M. Otis, M.D., Celina, Ohio.

Changes Occurring in the Blood of New-Born Infants Following Ultraviolet Therapy.
HEYWORTH N. SANFORD, M.D., Chicago
Discussion opened by M. L. Blatt, M.D., Chicago; Clifford G. Grulee, M.D., Chicago, and H. E. Irish, M.D., Chicago.

Physical Therapy in Gastro-Intestinal Disease.
LOUIS H. LEVY, M.D., New York City.
Discussion opened by Wm. Brams, M.D., Chicago, and George B. Lake, M.D., Chicago.

SECTION ON EYE, EAR, NOSE AND THROAT

Monday Afternoon, November 4, 1929

The Method of Choice in Tonsillectomy.
F. L. WAHRER, M.D., Marshalltown, Iowa.
Discussion opened by Gregg A. Dillinger, M.D., Pittsburgh, Pa., and J. H. Hester, M. D., Louisville, Ky.

The Treatment of Facial Paralysis.
W. L. CAHALL, M.D., Utica, N. Y.
Discussion opened by J. C. Elsom, M.D., Madison, Wis., and J. U. Giesey, M.D., Salt Lake City, Utah.

Radium in the Post Operative Treatment of Polypoid Sinusitis.
G. ALLEN ROBINSON, M.D., New York City.
Discussion opened by Roy Emmert Flesher, M.D., Chicago, and A. F. Tyler, M.D., Omaha, Nebr.

Physiotherapy as an Adjunct in the Treatment of Atrophic Rhinitis.
CARL B. SPUTH, M.D., Indianapolis, Ind.
Discussion opened by F. L. Alloway, M.D., Champaign, Ill., and F. L. Wahrer, M.D., Marshalltown, Iowa.

The Influence of Ultraviolet Radiations on Periodontal Diseases.
A. T. RAWMUSSEN, D.D.S., La Crosse, Wis.
Discussion opened by S. Wollenberger, D.D.S., Chicago, and C. E. Norris, D.D.S., Indianapolis, Ind.

SECTION ON SURGERY, GYNECOLOGY, ORTHOPEDICS AND UROLOGY

Monday Afternoon, November 4, 1929

The Use of Physiotherapy in Traumatic Cases.
E. H. REBHORN, M.D., Scranton, Pa.
Discussion opened by John Ellis, M.D., Chicago, and Frank H. Walke, M.D., Louisville, Ky.

Physical Therapy in Industry.
C. H. OGDEN, M.D., Chicago.
Discussion opened by J. S. Coulter, M.D., Chicago, and R. W .McNealy, M.D., Chicago.

Low Voltage Currents in Contractures of the Hand.
LOUIS GRIES, M.D., Chicago.
Discussion opened by Frederick H. Morse, M.D., Boston, and C. M. Westerman, M.D., St. Louis.

Physical Therapy Indications in Gynecology.
JOSEPH E. G. WADDINGTON, M.D., Detroit, Mich.
Discussion opened by Louis Rudolph, M.D., Chicago, and H. D. Holman, M.D., Mason City, Iowa.

After Treatment of Tarsal and Metatarsal Fractures.
JOHN D. ELLIS, M.D., Chicago.
Discussion opened by P. H. Dorne, M.D., Chicago, and C. R. G. Forrester, M.D., Chicago.

Evening Session, Monday, November 4, 1929

Experimental Studies in Pernicious Anemia, Pemphigus and Leprosy.
DAVID I. MACHT, Ph.D., Johns Hopkins University, Baltimore, Md.
Discussion opened by Leon Bloch, M.D., Chicago, Erwin P. Zeisler, M.D., and Francis E. Senear, M.D., Chicago.

The Penetration of Ultraviolet Light Into the Human Skin.
ALBERT BACHEM, Ph.D., University of Illinois, Chicago.
Discussion opened by David I. Macht, Ph.D., Baltimore, Md., and I. S. Falk, M.D., Chicago.

SECTION ON MEDICINE, DIAGNOSIS, PEDIATRICS, NEUROLOGY, ENDOCRINOLOGY

Tuesday Afternoon, November 5, 1929

Radiant Energy as Applied to Skin Lesions.
WALTER J. HIGHMAN, M. D., New York City.
Discussion opened by C. H. Warfield, M.D., Chicago, and Benj. H. Sheman, M.D., Dexter, Iowa.

A Successful Electro-chemical Treatment for Acne.
C. AUGUSTUS SIMPSON, M.D., and H. FORD ANDERSON, M.D., Washington, D. C.
Discussion opened by A. F. Tyler, M.D., Omaha, Nebr., and Louis Gries, M.D., Chicago.

Chronic Arthritis, Classification with Reference to Treatment.

N. J. SEYBOLD, M.D., Toledo, Ohio.

Discussion opened by J. C. Elsom, M.D., Madison, Wis., and J. S. Coulter, M.D., Chicago.

Ultraviolet Radiation and Medical Care Versus Surgery in the Treatment of Renal Tuberculosis.

ALBERT M. CRANCE, M.D., Geneva, New York.

Discussion opened by Gustav Kolischer, M.D., Chicago, and Owsley Grant, M.D., Louisville, Ky.

SECTION ON SURGERY, GYNECOLOGY, ORTHOPEDICS AND UROLOGY

Tuesday Afternoon, November 5, 1929

Contraindications to the Use of Physiotherapy in the Treatment of Goiter.

ARNOLD S. JACKSON, M.D., Madison, Wis.

Discussion opened by Maximilian Kern, M.D., Chicago.

Seminal Vesicultitis and Diathermy.

WINFIELD SCOTT PUGH, M.D., New York City

Discussion opened by H. C. Rolnick, M.D., Chicago, and Edwin W. Hirsch, M.D., Chicago.

Nonvolatile Anesthesia in Electrosurgery—With Special Reference to Intravenous Somital.

EDWIN N. KIME, M.D., Indianapolis, Ind.

Discussion opened by G. Kolischer, M.D., Chicago, and D. Kobak, M.D., Chicago.

The Prognostic Value of the Malignancy Index Based on Five Year End Results of Carcinomata of the Breast and Cervix.

HENRY SCHMITZ, M.D., Chicago.

Discussion opened by Gustavus M. Blech, M.D., Chicago, and A. David Willmoth, M.D., Louisville, Ky.

Physical Therapy for Industrial Injuries. Is It of Economic Value?

DRS. ORR and THOMPSON, Omaha, Neb.

Discussion opened by John S. Coulter, M.D., Chicago, and Emil C. Duval, M.D., Chicago.

SECTION ON EYE, EAR, NOSE AND THROAT

Tuesday Afternoon, November 5, 1929

Value of Iodized Oil in Nasal Accessory Sinus Disease.

ROBERT W. FRAZER, M.D., Battle Creek, Mich

Discussion opened by Harold Hays, M.D., New York City, and Frank J. Novak, Jr., M.D., Chicago.

Physical Procedures in the Treatment of Nasal Sinuses.

ARTHUR W. PROETZ, M.D., St. Louis, Mo.

Discussion opened by A. H. Andrews, M.D., Chicago, and George W. Boot, M.D., Chicago.

Surgical Diathermia in Accessible Neoplasms About the Head.

GEORGE W. BOOT, M.D., Evanston, Ill.

Discussion opened by A. L. Yocum, M.D., Chariton, Iowa; D. Kobak, M.D., Chicago, and J. Thompson Stevens, M.D., Montclair, N. J.

The Treatment of Deafness by Physical Therapy. (With demonstration of some new appliances.)

LOUIS H. LEVY, M.D., New York City.

Discussion opened by Ellis G. Linn, M.D., Des Moines, Iowa, and A. R. Hollender, M.D., Chicago.

Electrocoagulation in Tonsil Dissections.

W. H. TAYLOR, M.D., St. Marys, Ont., Canada.

Discussion opened by Raymond F. Elmer, M.D., Chicago, and P. H .Greeley, M.D., Portsmouth, N.H.

Evening Session, Tuesday, November 5, 1929

Important Facts Concerning the Diathermy Machine and Its Current.

WILHELM STENSTROM, Ph.D., Associate Profesosr Biophysics, University of Minnesota, Minneapolis, Minn.

Discussion opened by Disraeli Kobak, M.D., Chicago; F. H. Ewerhardt, M.D., St. Louis, Mo., and Norman E. Titus, M.D., New York City.

Physical Therapy in the Regulation of Acid-Base Equilibrium.

Victor E. Levine, M.D., Ph.D., Creighton University, Omaha, Nebr.

Discussion opened by A. C. Ivy, Ph.D., Northwestern University, Chicago, and C. I. Reed, Ph.D., Chicago.

SECTION ON MEDICINE, DIAGNOSIS, PEDIATRICS, NEUROLOGY, ENDOCRINOLOGY

Wednesday Afternoon, November 6, 1929

Muscle Education.

JOHN S. COULTER, M.D., Chicago.

Discussion opened by Louis Gries, M.D., Chicago, and Norman E. Titus, M.D., New York City.

Radium as a Therapeutic Agent.

C. J. BROEMAN, M.D., Cincinnati, Ohio

Discussion opened by F. E. Simpson, M.D., Chicago, and A. F. Tyler, M.D., Omah, Nebr.

Physical Therapy in Gastro-Enterology: Some Atonic Conditions and Their Treatment.

C. F. VOYLES, M.D., Indianapolis, Ind.

Discussion opened by I. M. Trace, M.D., Chicago, and B. H. Sherman, M.D., Dexter, Iowa.

Further Studies in the Problem of Obesity.

MAXIMILIAN KERN, M.D., Chicago, Ill.

Discussion opened by Victor E. Levine, M.D., Ph.D., Omaah ,Neb.

Physical Therapy in Arthritis.

PHILIP LEWIN, M.D., Chicago.

Discussion opened by J. C. Elsom, M.D., Madison, Wis., and Frank H. Walke, M.D., Shreveport, La.

Physiotherapy in Relation to Surgery.

RICHARD J. BEHAN, M.D., Pittsburgh, Pa.

Discussion opened by Adolph A. Lilien, M.D., New York City, and G. P. Lawrence, M.D., Westerville, Ohio.

Blood Metabolism, Old Theory vs. New.
HAROLD M. JOHNSON, M.D., Buffalo, N. Y.
Discussion opened by C. E. Stewart, M.D., Battle Creek, Mich., and C. F. Voyles, M.D., Indianapolis, Ind.

SECTION ON EYE, EAR, NOSE AND THROAT

Wednesday Afternoon, November 6, 1929

Asthma—Its Diagnosis and Treatment.
FERRIS SMITH, M.D., Grand Rapids, Mich.
Discussion opened by Arthur W. Proetz, M.D., St. Louis, Mo.; John J. Shea, M.D., Memphis, Tenn., and Ellis B. Freilich, M. D., Chicago.

Physical and Electro-Therapy in Oto-Laryngology.
HAROLD HAYS, M.D., New York City.
Discussion opened by Frank J. Novak, Jr., M.D., Chicago, and Harry L. Pollock, M.D., Chicago.

Tribromethylalcohol (Avertin) Anesthesia for Electro-surgery About the Head and Neck.
W. REESE GUTTMAN, M.D., and JOSEPH R. GUTTMAN, M.D., Chicago, Ill.
Discussion opened by Edwin N. Kime, M.D., Indianapolis, Ind., and Thomas C. Galloway, M.D., Evanston, Ill.

Electro-Therapeutics as Applied to Modern Oto-Laryngology.
JOHN J. SHEA, M.D., Memphis, Tenn.
Discussion opened by M. H. Cottle, M.D., Chicago, and F. L. Wahrer, M.D., Marshalltown, Iowa.

Small X-Ray Dosage in Deafness.
J. J. RICHARDSON, M.D., Washington, D. C.
Discussion opened by Harry Thometz, M.D., Chicago, and W. L. Cahall, M.D., Utica, N. Y.

The Treatment of Diphtheria Carriers.
G. P. LINGENFELTER, M.D., Denver, Colo.
Discussion opened by E. G. Linn, M.D., Des Moines, Ia.; J. H. Hester, M.D., Louisville, Ky.

SECTION ON SURGERY, GYNECOLOGY, ORTHOPEDICS AND UROLOGY

Wednesday Afternoon, November 6, 1929

The High Frequency Currents in the Treatment of Cancer.
H. HARTWELL BASS, M.D., Durham, N. C.
Discussion opened by Roswell T. Pettit, M.D., Ottawa, Ill., and A. L. Yocom, M.D., Chariton, Ia.

Radiosensitivity of Tumors.
GAGE CLEMENT, M.D., Duluth, Minn.
Discussion opened by Julius Brams, M.D., Chicago, and N. S. Zeitlin, M.D., Chicago.

The High Frequency Current in the Treatment of Chronic Endocervicitis.
MORTIMER N. HYAMS, M.D., New York City.
Discussion opened by Budd C. Corbus, M.D., Chicago, and Miles J. Breuer, M.D., Lincoln, Nebr.

Ultraviolet as an Aid in the Preparation of a Patient for Operation.
VICTOR E. LEVINE, M.D., PhD., Creighton University, Omaha, Nebr.
Discussion opened by Edwin N. Kime, M.D., Indianapolis, Ind., and E. C. Henry, M.D., Omaha, Nebr.

A Statistical Study of the Uses of Diathermy and the Actinic Ray in a Gynecological and Obstetrical Practice. With Brief Report of a Few Interesting Cases.
THOMAS B. SELLERS, M.D., F.A.C.S., and JOHN T. SANDERS, M.D., New Orleans, La.
Discussion opened by Haldor Carlsen, M.D., Chicago, and H. D. Holman, M.D., Mason City, Iowa.

JOINT MEETING OF ALL SECTIONS

Thursday Morning, November 7, 1929

Sun Cure for Tuberculous Children.
RICHARD T. ELLISON, M.D., Philadelphia, Pa.
Discussion opened by I. Harrison Tumpeer, M.D., Chicago, and Benj. Goldberg, M.D., Chicago.

Treatment of Pain in the Arm and Leg.
ARCHIBALD P. EVANS, M.D., New York City.
Discussion opened by J. U. Giesey, M.D., Salt Lake City, Utah, and Esther T. Frankel, M.D., Chicago

Neon-Mercury Cold Light as Applied by Applicators to Cavities of the Body, Such as the Nasal, Buccal and Rectal. (Lantern slides.)
F. H. REDEWILL, B.S., M.A., M.D.,
LT. COM. JAMES POTTER, M.D., U.S.N.,
COM. HARRY GARRISON, M.D., U.S.N.,
San Francisco, Calif.
Discussion opened by J. E. G. Waddington, M.D., Detroit, Mich., and Edwin N. Kime, M.D., Indianapolis, Ind.

Thursday Afternoon, November 7, 1929

Accuracy in the Measurement of X-ray and Radium Doses.
U. V. PORTMAN, M.D., Cleveland, Ohio.
Discussion opened by Norman E. Titus, M.D., New York City, and Roswell T. Pettit, M.D., Ottawa, Ill.

Motion Picture Demonstration of the Treatment of Bone Infections.
MAX THOREK, M.D., Chicago.
Discussion opened by Maurice Bernstein, M.D., Chicago, and F. W. Carruthers, M.D., Little Rock, Ark.

The Resistance of Various Tissues for Various Electric Currents.
ALBERT BACHEM, Ph.D., Chicago.
Discussion opened by D. Kobek, M.D., Chicago, and Norman E. Titus, M.D., New York City.

EXHIBITORS

Cameron's Surgical Specialty Co., 666 W. Division St., Chicago, Ill.

McIntosh Electrical Corp., 223 N. California Ave., Chicago, Ill.

American X-ray Corp., 711 W. Lake St., Chicago, Ill.

Hanovia Chemical & Mfg. Co., Newark, N. J.

National Carbon Arc, Inc., Cleveland, Ohio.

Vitaglass Corp., 50 E. 42nd St., New York City, N. Y.

The Fair, State, Adams and Dearborn Sts., Chicago, Ill.

The Burdick Corp., Milton, Wis.

S. H. Camp & Co., Jackson, Mich.

A. S. Aloe Company, 1819 Olive St., St. Louis, Mo.

Britesun, Inc., 3735 Belmont Ave., Chicago, Ill.

Victor X-ray Corp., 2012 W. Jackson St., Chicago, Ill.

F. C. Herman Co., Dr. Holms Vibratone, 25 E. Washington St., Chicago, Ill.

H. G. Fischer & Co., 2333 Wabansia Ave., Chicago, Ill.

Battle Creek Food Co., Battle Creek, Mich

Middlewest Instrument Co., 1870 Ogden Ave., Chicago, Ill.

Kelley-Koett Mfg. Co., Covington, Ky.

Sanborn Company, 26 Lansdown St., Cambridge, Mass.

Clinical Medicine & Surgery, North Chicago, Ill.

Kellogg Company, Battle Creek, Mich.

INTERNATIONAL ABSTRACTS

Radium in the Treatment of Menorrhagia of Adolescence and of the Menopause. L. J. Stacy, M. D., and R. D. Mussey, M. D., Amer. J. Obst. & Gynec. 17:502, 1929.

The patients treated for menorrhagias may be divided into two groups: Those in adolescence, and those at, or approaching, the menopausal age. The first group included 15 patients, ages 14 to 21, treated between the years of 1916 to 1929. The results showed a definite tendency to improvement. Two patients, however, needed a second exposure of radium and a third had to have the uterus removed at a later date. The radium exposure causes a variable period of amenorrhea, following which some of the patients were partially or completely improved. The dosage employed in the adolescent group were necessarily small and conservative—200 to 250 mg. hours was the average dose. The author feels that "it is better to err on the safe side and repeat the dose several months later than to use a dose that might permanently injure the ovarian tissue." Stacy and Mussey find that radium is very valuable in controlling menorrhagias of the menopause. The dosage in this group is higher—about 800 to 1000 mg. hours, and a single dose gave satisfactory results in 90 per cent of the patients treated. The greater the dosage the more precise and prolongd is the period of amenorrhea that follows. The use of radium is contraindicated when there are evidences of pelvic infection, even as far back as 10 years previously. For patients forty years or more a preliminary curettage is done before radium is inserted.

The Effects of X-ray and Radium Upon the Fetus in Utero. Percy W. Toombs, M. D. Amer. J. Obst. & Gynec. 17:516, 1929.

This report is essentially a review and discussion of the literature bearing on this subject. Toombs finds that the diagnostic x-ray exposure is harmless to the fetus; but when the roentgen ray is used for therapeutic purposes there can be definite harm caused to the developing fetus. The early fetus exposed to prolonged therapeutic ray exposures will die and abort, or become deformed. The eyes, brain and spinal cord are prone to the subsequent deformities. In the presence of malignancy Toombs takes the stand that the fetus must be disregarded and the mother favored with the necessary therapeutic exposure.

Five-Year End-Results of Radiation Treatment of Cancer of the Oral Cavity, Naso-Pharynx and Pharynz. B. F. Schreiner. Radol. Rev. 51:327-332, August, 1929.

The end-results of the treatment of epithelioma of the oral cavity with bare seeds is superior to surface applications. Surface applications of radium in Group I cases of the oral cavity show a five-year healing in 5 per cent of the 43 cases treated.

The implantation with bare seeds in Group I cases

of the oral cavity shows a five-year healing in 17 per cent of the 69 cases treated. In Group II a five-year healing of 2 per cent of the 123 cases treated.

Tobacco, dental caries and luetic infections are very prominent factors in this series of cases. The prognosis is better in cancer involving the inner cheek and upper gum than in the floor of the mouth and lower gum. After careful study of the survey of the methods and end-results of this series of cases, and the author's experience with gold implants since 1926, he has greater hopes for the future.

Two Simple Methods of Purifying Radium Emanation. W. G. Moran, B.Sc. Am. J. Roentgenol. 22:147-149, August, 1929.

A simple apparatus for the purification of radium emanation is described, which is low in cost and easy of operation. The use of liquid air is avoided and the removal of water vapor has been found unnecessary. Two different methods of purification are given. One method ignites the oxygen and hydrogen with a hot copper oxide filament which also oxidizes the excess hydrogen. The other method uses a spark to unite the oxygen and hydrogen, while the excess hydrogen passes through the walls of a heated palladium tube into the outside air. The emanation is pumped from the solution into the single small purifying tube and from there pushed directly up into the thin-walled capillary. The emanation may be withdrawn and collected over mercury at any stage in the purification. The concentration attained compares favorably with the results obtained with complicated installations.

Epiphysitis of Adolescents, With Special Reference to Etiology. L. A. Smith, M.D. Am. J. Roentgenol. 22:127-137, August, 1929.

A large group of epiphyseal lesions, commonly known as epiphysitis of adolescents, are considered by many observers to be fundamentally related in etiology and pathology. The various theories as to etiology of this type of lesion are reviewed. Several cases of silent epiphyseal lesions of unusual type are illustrated, which are probably more common than has been believed. Lesions of various epiphyses are presented with such association with infection as to indicate that infection is a probable cause of many of this type.

Quartz Light Therapy in Pulmonary Tuberculosis. F. E. O'Brien, M.D. New England J. Med. 201:403-408, August, 1929.

Artificial heliotherapy combined with sanatorium routine is a valuable adjunct in the treatment of pulmonary tuberculosis. It is an effective aid in assisting the reduction of temperature and building up the general resistance of the patient. The very far advanced cases with high temperature do not gain any advantage in artificial heliotherapy because of effort required in treatment. Hemoptysis is not a contraindication to artificial heliotherapy. Artificial heliotherapy without rest treatment would not be very beneficial in pulmonary tuberculosis. A marked decrease in lung moisture and decrease in severity of cough is especially noticeable with quartz light therapy. There is no advantage in producing erythema in treatment and gradual tanning is not necessary. Artificial heliotherapy has a sedative effect upon the patient. Artificial heliotherapy assists the natural healing processes in tuberculosis by assisting expectoration in the beginning and later in reducing the amount. Careful study of the individual patient and further research in artificial heliotherapy combined with follow-up work should reveal further advantages of this adjunct in treatment of pulmonary tuberculosis.

The Status of the Therapeutics of Irradiated Ergosterol. A. F. Hess, J. M. Lewis and Helen Rivkin. J. A. M. A. 93:661-665, August 31, 1929.

Further clinical experience with preparations of irradiated ergosterol has shown that it is a specific for rickets, tetany and osteomalacia. As yet it has not been proved of definite value in other clinical conditions.

In the past year, a standard dosage has been established for the prevention and cure of rickets. Premature and exceptionally rapid-growing infants must be regarded as a separate group and dosage gaged according to a different scale. The basis of this standardization is a biologic estimation of antirachitic potency rather than a gravimetric assay of the irradiated ergosterol.

It has been found that, if the prescribed dosage is observed, neither toxic symptoms nor hypercalcemia need be feared. These phenomena seem to be entirely or almost entirely due to an excess of antirachitic action. Hypercalcemia can also be induced experimentally by giving undue amounts of cod liver oil.

Irradiated milk, especially dried milk, is likewise a valuable product in combating rickets and tetany, more especially in their prevention. Irradiated cereals will probably play no role in the control of rickets.

In view of the numerous technical difficulties involved in the course of activation, such biologic products as irradiated ergosterol and irradiated foods should be subjected to careful laboratory control.

Notes on Some Malginant Bladder Tumors Treated With Radium. W. Neill, Jr., M.D. Urol. & Cutan. Rev. 33:577-579, September, 1929.

Radium properly administered surpasses all other forms of treatment. With its use there is an absence of the mortality and morbidity of a surgical removal. The treatment occasions far less discomfort. Except where a suprapublic incision is made the patients are ambulatory, rarely needing a stay in the hospital. The percentage of cures is larger, as attested by the 35 per cent reported in 57 cases that might have been included in the operable class, while in 111 totally inoperable and far advanced a cure of 9.9 per cent was obtained. In far advanced cases there is definite hope of palliation

and prolongation of life. An economic consideration is the fact that, unless too depleted from the growth at the time treatment is first begun, the patient often is able to work, during the interval of treatments. The advent of radium greatly enhances our interest in this hitherto forlorn group, making such patients interesting and desirable, and they are no longer looked on askance as formerly.

The Value of X-Ray and Radium in the Treatment of Breast Carcinoma. J. W. Cathcart. Southwest. Med., 13:224-227, May, 1929.

Radiation has a definite place in the treatment of breast carcinomas. Preoperative radiation of operable breast malignancies will, the writers believe, give the largest number of five-year cures.

Postoperative radiation should be administered for at least two cycles—one about two or three weeks after operation, the other, after a lapse of four weeks. If the malignancy had extended beyond the breast at time of operation, then at least four series of treatments should be given.

Cases of inopeabrle recurrent breast carcinoma may have suffering decreased and lives prolonged by radiation. A reasonably accurate prognosis can be made in each case by use of the Lee clinic index.

Efficiency Conditions in Diathermy Circuits. L. H. Clark. Brit. J. Radiol., 2:315-322, June, 1929.

When an electrolyte placed in the resonant circuit of a diathermy machine, the apparatus energy (amperes x volts x time) required to produce a given rise of temperature is modified by: (1) A change in the frequency of the diathermy current. The apparent energy producing the given temperature rise diminished as the frequency is reduced. (2) The insertion of condensers in parallel or in series with the electrolyte, especially for values of the capacity near that which produces resonance. The apparent energy is a maximum under resonance conditions.

Experiments to Determine the Relative Efficiency of Pads Moistened With Saline Solution and Lead Plates as Electrodes With Diathermy Currents for the Production of Heat in a Patient. G. Simon. Brit. J. Radiol., 2:242-249, May, 1929.

Pads soaked in 16 per cent saline tended to become less heated than the media on which they were placed as electrodes, the ratio of surface to depth of heat being about the same as with lead applied directly on the media.

On a living subject the maximum temperature recorded by a thermometer on the skin was slightly greater with lead sheets than when pads soaked in 16 per cent saline were used.

The maximum temperature obtainable just beneath the skin was likewise greater with lead electrodes than with saline soaked pads; the difference, however, was only 0.7° C.

On this subject, the maximum temperature obtained just beneath the skin was 41.4° C. (106.5° F.). These experiments indicate that the maximum temperature obtainable just beneath the skin will be slightly higher when lead sheets placed directly on the skin are used as electrodes, than when saline soaked pads are placed between the lead and the skin.

The Excitation of Bactericidal Fluorescence by Beta and Gamma Rays. R. R. Peacock and L. E. H. Whitby. Brit. J. Radiol, 2:228-232, May, 1929.

Calcium phospho-tungstate in 5 per cent solution has an increased bactericidal efficiency when excited by beta or gamma rays, similar to that shown under x-ray excitation. It is possible that this effect may be due to an impurity.

Investigation of an Ionization Chamber for X-Ray Measurements. L. R. G. Treloar. Brit. J. Radiol., 2:188-195, April, 1929.

An air chamber is described in which the radiation passes perpendicularly through electrodes of graphited paper. The ionization produced in this chamber by homogeneous radiation of wave-length .71 A-U and 1.54 A-U is compared with that produced in an ordinary parallel plate electrode chamber.

It was found that each electrode surface contributed an additional ionization equal to that which woulld be produced by the radiation in passing through .35 mm. of air. This quantity showed no variation with wave-length or distance of separation of the electrodes over the ranges employed.

The advantages and disadvantages of this type of chamber, for relative and absolute measurements of x-ray intensity, are discussed. Experiments were also made on the effect of metal electrodes, and it is shown that the ionization due to the electrodes in general increases with atomic number, as would be expected from theoretical consideration.

Radiology as a Medical Specialty. W. E. Chamberlain. Radiol., 13:229-233, September, 1929.

The problem of lay laboratories will not disappear until the medical profession recognizes that radiology is truly a branch of medicine, and that it is fundamentally wrong to send patients to lay laboratories.

There will not be a satisfactory influx of young medical graduates into radiology, nor a satisfactory development of radiology in the hospitals until the relation between hospitals and radiologitss, have been improved. The hospital radiologist must be offered an opportunity for self-development comparable with that of his brothers in medicine and surgery.

Under the present scheme of things there are many instances of the exploitation of radiologists by hospitals from the radiologist's services constitutes exploitation whenever such profits exceed what can be justified by the material outlay and investment in apparatus and

for radiologic services because most of those now in space.

There is need for a revision in the fee schedules for radiologic services because most of those now in operation place the radiologist in the position of selling celluloid by the square inch instead of rendering a type of medical consultation service.

Bone Tumors. J. Newton Sisk. Radiol., 13: 115-123, August, 1929.

Treatment of bone tumors in the past has been undertaken in most cases late in the disease when it has probably already become systemic.

Indifference of general practitioners to the serious probabilities arising from apparently trivial early history of bone lesion often delays correct diagnosis and treatment.

Confusion of terminology and classification has interfered for many years with progress in the management of bone diseases.

Malignant bone tumors do not usually fit any simple diagnostic scheme of classification; therefore, the best analysis of a bone tumor the roentgenologist can give is an accurate opinion as to whether it is benign or malignant. The value of radiation therapy is as yet undetermined and conclusions concerning it should be suspended until further evidence has been reported.

Radiation and Its Uses in the Treatment of Urologic Neoplasms. C. A. Watters. Radiol., 13:109-114, August, 1929.

An attempt has been made in this paper to present in brief the role played by radium and deep x-ray therapy in the treatment of genito-urinary neoplasms.

Statistics have been purposely omitted, and in their place have been submitted the authors' methods of treating these tumors, based on the results of a critical statistical survey of a large series of malignant tumors of all kinds.

The Effects of X-Rays on the Gall-Bladder: Experimental Production of an X-Ray Cholecystitis. Julius Brams and Leo Darnbacher. Radiol., 13:103-108, August, 1929.

A definite acute and chronic cholecystitis was experimentally produced in a series of dogs with dosages of x-rays that are within the range of those used for therapeutic purposes. The changes produced are destructive. They consist of hemorrhage, inflammatory edema, round-cell infiltration, fibrous tissue hyperplasia, and in some instances, necrosis of the epithelium and resemble the type of cholecystitis produced by chemical means. Basing their opinion on the relative lack of injury to the exposed portion of the duodenal and pyloric mucosa, the writers believe that the gall-bladder epithelium is comparatively more sensitive to roentgen ray exposure than the other organs in opposition to it.

The possibility of injury to the gall-bladder following deep therapy in the region of the right upper quadrant of the abdomen must be borne in mind.

The Importance of Filtration and Superiority of Pure Gamma Radiation in the Radiotherapy of Malignant Tumors. A. Lacassagne. Radiol., 13:95-102, August, 1929.

The work of Dominici has established, since 1907, for units of radium salts, the greatest efficacy against cancer cells and the greatest harmlessness for normal tissues of the gamma radiation obtained with a minimum filtration of one-half millimeter of platinum.

It has been established experimentally that unfiltered units of radon provoke around themselves a zone of diffuse necrosis of all the tissues; this zone becomes narrower the more one increases the filtration or decreases the intensity of radiation, beyond a certain thickness of platinum and for a definite intensity radium necrosis may be completely eliminated.

Radium necrosis is the cause of grave accidents; hemorrhage, paralysis, neuritis, bony sequestration, radium dermatitis, perforation, infection. It offers no compensating advantage.

The technics of curietherapy with pure gamma radiation which offer the same technical and a greater efficacy in the treatment of cancer than technics with composite radiation, should be preferred to them.

Physical Therapy in Joint Conditions. G. R. Baldwin. Am. J. Phys. Therap., 6:258-260, September, 1929.

The author has had some very good results in treating arthritis with physical therapy. Some cases were given up as hopeless and other cases were not so serious when they came under his care.

He cites ten different cases which he treated after he had applied diathermy to his own shoulder for arthritis and was pleased to find that after four treatments, of thirty minutes each, from 1,150 to 1,350 milliamperes, the joint returned to normal.

In general the results of the treatments in these few cases were very good. In two, diathermy effected an improvement and perhaps would have completely cured the patients had they returned for more treatments. In two cases the treatment was a failure, while in the remainder of cases the treatment cured the disease. The author believes that psychological influences take a hand in treatment of "organic" diseases and this perhaps would account for the varying responses made to the same remedies in identical conditions.

Some Experiences With the Use of Radium in Urology. Leo C. Dubois. Radiol. Rev., 51: 345-348, August, 1929.

Radium has a selective effect on diseased or improperly nourished tissue, as well as on capillar endothelium. Radium has been of special value in the treatment of both malignant and benign conditions of the genito-urinary tract. Stimulating doses of radium have been used in a large number of cases of chronic passive congestion of the posterior urethra with highly satisfactory results.

Heliotherapy-Empirical or Scientific? J. R. Earp. Brit. J. Tuberc., 23:137-139, July, 1929.

In the treatment of rickets with light, it has been found to be a specific remedy that can be relied upon to give results.

In the treatment of tuberculosis, it is doubtful what an important part light plays in the cure. There are three factors to be measured in treating tuberculosis, namely: light, radiant heat and the cooling power of moving air. None of these agents, however, are ever measured.

The author suggests two reasons to explain why light has not been measured. They are: (1) variety of the energy in the sun's rays at different hours of the day, and (2) the apparatus for measuring is complicated and very expensive. The method devised by Clark is advocated by the writer to be simple to operate and accurate enough for all practical purposes.

The Use of Physiotherapy in General Surgery. J. L. Holzman. Med. Sentinel, 37:528-531, September, 1929.

The use of quartz light, radiation and diathermy are very valuable aides to the surgeon in the types of conditions discussed. The physiotherapeutic measures mentioned are not "cure alls" and are advised only as adjuncts to recognized surgical procedures.

Graded Cancer of the Breast and Metastases. E. J. Grace, M.D. Long Island Med. J., 23: 523-526, September, 1929.

It represents a sound method for the average surgeon or clinician to interpret the behavior of cancer. Duration of lesion and operative procedure being equal the patient's future and outcome may be planned in accordance with the grade of the tumors.

The value of the x-ray except possibly in very cellular grade four tumors is extremely debatable. The metastasis in cancer of the breast increases in direct proportion to the grade of tumors.

Ophthalmic Light Therapy. C. A. Bahn, M.D. New Orleans Med. & Surg. J., 82:144-149, September, 1929.

Bodily light baths under reasonable supervision are an important adjunct to other treatment in numerous bodily diseases which directly or indirectly affect the eye and are especially indicated in children with deficiency of bodily development and nutrition. They are also of value in adults leading indoor lives, receiving insufficient sunlight, and showing excessive fatigue or other evidence of bodily disfunction .

Sunlight for this purpose is at least the equal in therapeutic value of any artificial light yet devised and generally speaking is preferable.

Ultraviolet light in therapeutic doses apparently increases cell activity, stimulates pigment formation, destroys bacteria, increases lymphatic circulation, and produces substances which increase bodily immunity.

Ultraviolet ocular therapy is a valuable adjunct to other treatment, especially in certain types of superficial diseases involving infection or delayed cell reproduction and recovery, such as the herpetiform affections and dystrophies.

The most promising field for ultraviolet ocular therapy apparently lies in the prevention or arrest of infected ulcers and herpes and in its early use following injuries showing the first signs of delayed healing.

The use of analin dyes in ulcerative affections and powdered dionin in non-ulcerative affections immediately prior to ultraviolet treatment, apparently markedly accentuate its therapeutic effect.

Especially in pneumoccocca cornel ulcers, light treatment alone cannot be depended upon sufficiently to justify its exclusive use, but should be used with other treatments. The Birch-Hirschfield irradiation apparatus has proved satisfactory used with uviol filter alone. Infra-red ocular therapy is we believe the most pleasant form of heat application and is an excellent analgesic in all painful and inflammatory ocular affections.

Contribution A L'Action Therapeutique Des Rayons De Bucky Sur Les Visceralgies. Denier. (Contributions to the Therapeutic Action of Borderline Rays on Visceralgias.) Bull. et mem. de la Soc. de Radiol., 17:178-181, No. 160, June, 1929.

The author has obtained good results in visceralgias by borderline or Bucky rays provided an erythema dose is given. In contra-distinction to Bucky he never saw any success occurring without erythema dose.

The cases, in which the author applied borderline rays, mostly 150 milliminutes, are as follows:

(1) Pyoropasm after cholecystitis. Irradiations were administered to the spot of the greatest sensibility of the skin. As soon as erythema appeared, pain disappeared. Diathermy had previously been applied for a week.

(2) Atonia of the stomach with algia of the solar plexus. Appetite returned following irradiation of the epigastrium. Instead of erythema a permanent pigmentation came on in this patient on the seventh day.

(3) Cleared up salpingo-ovaritis with douglassitis and fulminating pain in the lumbar region. Four diathermy treatments had already been done. On irradiation of the suprapubic region with borderline rays pain disappeared from the moment the erythema appeared. The author observes, however, that patient had had her menses a fortnight ago, and that, at times, spontaneous remissions occur in the intermenstrual period.

(4) Raynaud's disease. Despite simultaneous applications of diathermy and x-raying of the cervical intumescence, the fingers were still cyanotic following seven diathermy and two x-ray exposures; it was the borderline rays which produced sensation of warmth in the fingers after four days. The irradiation had been administered only once at the level of C_5-D_2, 5 cm. focal distance and 150 millimeters.

In order to explain the action of borderline rays the author adopts the theory of Verger. According to it vessel tufts are surrounding the sensitive cutaneous and subcutaneous organs, and vasomotor fluctuations of the same are transmitted as stimuli to the sensitive endings—hence the algias in Raynaud's disease, coxalgias and erythromelalgias. The whole of the reflex can be assumed as being of sympathetic nature. Now the treatment by borderline rays produce dilation of these vessel tufts, the expression of which is just the erythema. The latter appears in about two days following irradiation, persists for about a fortnight under occasional slight skin edema, leaves behind a frank pigmentation, and produces a retrograde counter-stimulus which suppresses the dysfunction of the viscus in question and restores the functional balance.

De L'Emploi Du Bistouri Diathermique Et Des Ondes Entretenues En Dermatologie. Giraudeau. (On the use of the diathermic scalpel and on waves utilized in dermatology.) Bull. de la Soc. franc. de Dermatologie, 1:20-26, Jan. 1929.

A special form of diathermy is discussed which differs very much from the common one, by the utilization of undamped waves from a high frequency transformer. The active electrode is made of a fine needle or platinum or steel thread which can be bent in the form of loops. The current must be switched on prior to application. The diathermic knife then very easily penetrates tissues, whether hard or fibrous without the bleeding or coagulation which occurs in ordinary diathermy. The incision produced thereby heals very rapidly. This method is very suitable for benign papillomata, keratoses, abscess, furuncles, condylomata acuminata; for taking material for histologic explorations and biopsies for scarifications in lupus, and as a fenestrated curette in lieu of the galvanocautery. Naevi and malignant neoplasm are to be reserved to the common diathermy. The treatment must be carried out under anaesthesia.

Ueber Die Roentgenbestrahlungen Bei Krankhaften Zustaenden Nach Operationem Am Verdauungstrakt. Martin Haudek. (On x-ray irradiation in morbid conditions following operations on the digestive tube.) Wiener med. Wochenschr., 79:540-542, April, 1929.

Extensive resection of the stomach for ulcer, no matter at which point it is seated, is today the favorite procedure of most surgeons; the results are far better, the complications much rarer. There is, however, a certain, though slight, percentage, which gives the surgeons a relative amount of worry. Painful cramps and vomiting of food are the chief nutritive troubles that threaten the patients. As far back as 1921 Lenk obtained improvement by x-ray irradiation in cases of gastroenteroanastomoses deficiency. Haudek has adopted this procedure in dysfunctions following gastric resection. The irradiation always afforded quick relief (in 20 cases), in many cases even complete suppression of the difficulty plus a conspicuous gain in weight. The disturbances of function are obviously of a spastic nature, and x-ray irradiation is an excellent means of combating them and controlling their cause which is thought to be an imbalance of the antonomous nervous system. Such irradiations exert also a preventive action against the appearance of gastric ulcers. The author has also administered irradiations in case of difficulties following cholecystectomies and obtained good results. In some cases of postoperative troubles after gastric resection two irradiations were sufficient to obtain prompt disappearance of the symptoms.

Die Roentgenbehandlung Des Asthma Bronchiale Durch Milzbestrahlung. Leopold Holst and D. Kaplunowa. (Roentgen treatment of asthma bronchiale by irradiation of the spleen.) Strahlentherapie, 32:505-515, May, 1929.

The authors obtained favorable results in irradiating the spleen in a great many cases of bronchial asthma. A definite explanation of this phenomenon is not given. It seems that there follows a desensitization of the system against the allergens which provoke the asthmatic attack. If the irradiation of the spleen proves unsuccessful, it should be followed by the irradiation of the lungs. The irradiation of the spleen deserves preference, as it takes less time in spite of similar success. Among 44 patients 38 (86 per cent) gave a positive result; only in 6 (14 per cent) did the treatment prove a failure. In 11 patients the result was striking and next to complete cure (25 per cent). The other 27 patients (61 per cent) showed notable improvement. Generally speaking, the result was far better in fresh cases than in chronic ones; in the latter ones, however, appreciable success was often obtained. In such patients as responded to the roentgen irradiation the success was often marked by heavy roentgen sickness. Definite success is not obtained until after two or three irradiations.

Technic: The spleen is irradiated anteriorly by the radiotransverter of Koch and Sterzel at a focal distance of 25 cm. with filtration by 0.5 mm. Cu. and 1 mm. Al. 165 kv. 2 MA. for 30 minutes. This equals about half a S.U.D. The second irradiation should be given only after three weeks. In case of failure or questionable reaction irradiation should only be repeated a third time at most. In the first days of irradiation the condition often grows worse, but is followed, as a rule, by improvement after from two to three days.

Bestrahlungsversuche Mit Quarzquecksilberdampflicht Unter Wasser. Josef Konrad and Karl Freidrich Pollaczek. (Attempts at irradiation with quartz mercury vapour light under water.) Zeitschr. f. d. ges. physik. Ther., 37:34-37, June, 1929.

Irradiations by the quartz mercury vapor lamp through a water layer produced a feebler erythema than

did subaquous irradiations under equal conditions. If hot water of 38-44 degrees C. is used erythema can, however, develop which is not substantially inferior to that of the control arm irradiated without interposition of water. If cold water of 14-19 degrees C. is employed, the difference in reaction of the two irradiated arms is conspicuous. There appears no reaction whatever or only a perceptible one at the foregoing temperature, while the arm serving as control presents an intense erythema. According to the author's suggestions the question as to whether it is possible to combine a water bed with simultaneous alpine sun therapy can therefore be answered in the affirmative when the temperature of the water bed is maintained at from 38 to 40 degrees C. As pollution of the water will hamper the action of rays it is necessary to administer the irradiation, if possible, immediately following daily cleansing. Above all, however, preventive measures must be taken in order to prevent accidents. This risk is not to be underrated, especially when mercury vapor lamps are utilized. At all events the possibility of drops of water reaching the burner should be precluded.

Multiplexe Epilation Mittels Diathermie. Karl Mezei. (Multiple depilation by diathermy.) Dermatologische Wochenschr., 88:720, May, 1929.

Up to date depilation by diathermy was carried out with one needle fixed in a needle holder; it is understood that in such a way only one hair follicle could be removed. Diathermic depilation signifies an advancement in the treatment of hypertrichosis as compared to the time wasting electrolysis. It has, however, disadvantages, viz., the troublesome holding of the needle electrode by the physician and more intense pain than in electrolytic depilation. Both these disadvantages are reduced by the instrument devised by the author, in which the needle holder is changed and the pain reduced to a fraction. With this instrument depilation is performed with several needles which are not insulated several mm. at their points. The remainder of the needles and the corresponding metal filament are insulated all over their length by enamel and silk so that the danger of burning by sparking is prevented The electrode is so constructed as to be able to hold any amount of filaments. The handle is a clamp into which as many filaments are applied as one chooses to work with. The larger the area submimtted to depilation, the larger is the amount of needles which can be applied. The needles are successively introduced into the hair papillae, then the current is switched on and allowed to act until coagualtion is complete. The intensity of the current necessary for the coagulation of one hair is to be empirically ascertained; hence, when there are several needles, the amperage is to be multiplied by the number of the needles, that is, the intensity of the current is to be increased. The hairs are afterwards removed by an eye lash pincer. The author insists that the patients do not feel anymore pain than they do when only one hair is removed.

Note of the author. The instrument is sold at Schulmeister's, Vienna, IX Spitalgasse 5 and at F. Reiner's, Vienna, IX Pelikangasse 6.

Ueber Die Behandlung Der Ischias. Georg Stiefler. (On the treatment of sciatica.) Wiener med. Wochenschr., 79:471-472, No. 15. April, 1929.

Diaphoretic procedures should be followed by the galvanization of the sciatic nerve. In stabile galvanization four large and well soaked plate-electrodes are applied to the affected extremity (sacrum, buttock, above the thigh, external and posterior aspects of the leg). The two superior and the two inferior electrodes are connected each by a bipartite conducting wire with each of the poles. The magnitude of the current-intensity is individualized and varies from 10 to 30 MA., the time of treatment averages 10 to 15 minutes. Local cutaneous lesions can always be avoided by carefully padding the electrodes which are augmented by underlying moistened gauze pledgets. Stiefler also makes frequent use of diathery (thermopenetration). It is not, however, so successful as galvanization, though there are, doubtlessly, cases in which galvanization fails, while diathermy succeeds. The author warns against faradization and the still more frequent application of high frequency irradiation. The latter impair true sciatica, and its beneficial effects can only be explained by erroneous diagnoses.

Die Klinisch-Physiologischen Untersuchungsergebnisse Der Transkutanbadetherapie. A. Ryskiewicz. (The results of clinical and pathological investigations on transcutaneous bathing cures.) Zeitschr. f. wissenschaftl., No. 4:324-333, January, 1929.

Transcutaneous baths represent an entirely new kind of stimulative balneotherapy which the author calls superficial stimulative therapy. According to the communications of the producing factory (Chemisch Pharmazeutisches Laboratorium, Ernst W. M. Hammel, Berlin W 30) the "Transcutan" consists of a combination of concentrated brine, certain volatile oils and catalytic activators. The congestion of the skin developing under the slowly acting stimuli of the Transcutan is reflex and general. Accelerates the bloodstream and thereby increases perfusion of the transcutaneously situated diseased foci. A further reaction is the reduction of blood pressure provided that the stimuli are slowly applied. Evidence of the strong stimulative character of the transcutaneous baths is also found in the acceleration of the sedimentation velocity of the red blood corpuscles. The transcutaneous baths proved beneficial in the author's hands in myalgias and rebellious arthritides.

The balneary addition is poured out on the surface of a complete bath of from 35 to 36 degrees C., the temperature of which can gradually be increased to the utmost limit of 40 degrees C. on the merits of each case. The patients remain in the bath for 5 to 10 min-

utes according to their constitution and stay, without having previously been dried, in a warmed bed for two hours.

Transcutaneous therapy permits of introducing the stimuli close to the patient, owing to the liposolubleness of the volatile oils. The stimulative effect of the brine is enhanced by heating.

Behandlung Der Gicht. Behr. (The treatment of gout.) Zeitschr. f. wissenschaftl., No. 14: 305-320, Jan., 1929.

The author utilizes dietetic, medicinal and physical measures and especially emphasizes the value of hydrotherapy. In superficial joints the mild, lukewarm or hot baths are the easier and more successful to use. Should the affection of the joints involve the whole of the limbs, one should resort to complete baths, but hot ones generally ought not to be given except in robust people and healthy circulatory conditions. If possible the baths are to be associated with active and passive movements. No doubt it is the thermic and stimulant properties of the baths in general which evoke their beneficial effect upon the uratic deposits in the tissues themselves and on the sequelae of gout-inducing lesions of the tissues. Mud (fango) casts and baths are also recommended. Mud baths as well as full hot baths should be applied cautiously. They are only indicated following previous tentative applications of local casts (fango) with slowly increasing temperature, in patients with extensive joint lesions and robust constitutions. Mud and peat baths should be prescribed only after the most careful examination of all organs, particularly the vascular system. Peat apparently has a specific property which raises it far above the other thermic procedures. A course of peat baths should comprise from 20 to 30 baths to be spread over four to six weeks. Peat and mud baths and fango casts artificially raise the inflammation in the torpid tissue. Phagocytosis is provoked and effects are elicited similar to those obtained by the modern stimulative proteintherapy. When the cardiovascular system is not quite in order, brine baths ought to be prescribed instead of mud and peat baths. Brine baths, containing carbonic acid, seem to possess local actions besides their general ones; it appears to favorably influence the sluggish circulation near the joints. Very intense heat may also be obtained by sand baths provided the sand is mingled thoroughly in order to distribute the heat evenly. For particularly sluggish affections vapor douches and douches with alternately cold and warm water are to be reserved if robust individuals are dealt with. Diathermy is an excellent treatment, but the sittings must be sufficiently long; after short, initial sittings they can be prolonged to half an hour. Massage, gymnastics and electrotherapy are to be resorted to as an aid to the hydropathic treatment. The author also lays stress on the value of sporting (outdoor exercise) in the periods free from seizures.

Zur Bewertung Der Solbaeder. H. Vogt. (On value of brines.) Zeitschr. f. wissenschaftl., 5:453-467, February, 1929.

The author enumerates the indications for the use of mineral waters, viz., general constitutional and infectious disorders of children (diatheses, metabolic anomalies, tuberculosis, scrofula); affections of the joints of various etiology in adults (articular tuberculosis, rheumatic gout, arthritis deformans, arthritis sicca of the menopause); disorders of metabolism (gout and rheumatism), for which hot brine baths are particularly qualified on account of their kinesitherapeutic effects; diseases of the skin because of the direct action of the brines; nervous diseases of organic and functional variety, which require a soothing influence; endocrine disturbances and difficulties of the vegetative nervous system to whom favorable influence of brine baths is attributed; in diseases of the heart, and finally chronic gynecological conditions associated with general faintness. The author emphasizes the sovereign property of brine baths as a means of invigoration. Its action apparently influences the vegetative system. He has observed that poorly developed children lose their tendency to infections and catarrhs, adults their tendency to catching cold. The rationale of the mode of action of brine baths is thus far only explained on an empirical basis. Vogt holds the essential action of brine baths to be an increase of tonus of the whole of the vegetative system.

Il Trattamento Roentgenherapico Degli Epiteliomi Cutanei Con Il Vecchio Metodo Bordier. Luigi Turano. (The roentgentherapy of epitheliomata of the skin by the ancient method of Bordier.) Radiol. Med., 6: 583-599, June, 1929.

The author has x-rayed 15 cases of epithelioma of the skin with success, the spark gap being 17 cm. no filtration being applied and the doses amounting to 20-25 H per exposure.

He obtained recovery 12 times and attributes the failures in the remaining three observations partly to the radioresistance of epitheliomata of the skin associated with metastases, and partly to previous treatment with x-rays or radium.

The author has physically proved that the tension he is employing is able to sterilize the subcutaneous tissue as far as 5 cm. in depth, while the dose below a tension of a 10 cm. spark gap is too small. He feels that the local action of the rays chiefly depends on the absorption, and a prominent part in the cicatrization of the epitheliomata of the skin is attributed to the connectival stroma.

The procedure recommended by the author is quite safe.

Regardless of the histological features of the cutaneous epitheliomata complete cicatrization is very often to be obtained within two months after the treatment, provided the lesion was not previously managed and there are no metastases.

The spark gap should not exceed 18 cm. nor fall below 15 cm., the irradiation is administered only once and without filters, and the dose not below 4 B nor superior to 5 B. Thus a sufficiently large portion is still left for the sterilization of the subcutaneous tissue.

With this procedure there never occurs radiodermitides, but only rapidly healing radioepidermitides.

Previously treated tumors are different to cure as they soon relapse, or only halt their evolution.

Sulla Radioterapia Dei Tumori Misti Della Parotide. Giovanni Balestra. (Radiotherapy on mixed neoplasms of the parotoid.) Radiol. Med., 16:574-583, June, 1929.

The author reports favorable results obtained with x-ray and radium therapy in three cases of mixed neoplasms of the parotid. The study included both the radioresistant mixed neoplasms, and the radiosensitive ones, too. Their radiosensitiveness is probably due to preponderance of parenchymatous elements and in a lesser degree to differentiation of the tumor constituents, i. e., connective or epithelial in character. The author advocates more extensive use of actinotherapy in the mixed neoplasms of the parotid and less surgical interferences with their risks (palsy of the facial nerve, salivary fistulae) and cosmetic disfigurement.

Apart from the available amount of radium, the mass of the neoplasm is an index whether x-ray or radiumtherapy has to be applied. A medium sized, mixed neoplasm can be treated with radium, while a very voluminous one lends itself, at least at first, only to x-raying.

Irradiation courses were given at intervals of from 20 days to two months. Each course consists of three sittings corresponding to three portals of entry (laterally, anteriorly and posteriorly) through which two thirds of the S.U.D. were applied according to the following technic: Focal distance 32 cm., spark gap 38 cm., amperage 2 MA., filtration by 0.5 mm. Cu. plus 2 mm. Al.

As for radiotherapy the author prefers the external use of radium to radium puncture on account of the relative benign condition of these mixed neoplasms, and the risk of injuring the important elements of the parotic region.

Licht Und Waermebehandlung In Der Gynaekologie. Wilhelm Flaskamp. (Light and heat treatment in gynecology.) Strahlentherapie, 32:672-694, No. 4, June, 1929.

Among conservative gynecologic methods physical therapy, in the form of cold, light, heat, massage, hydro- and balneotherapy and x-ray or radium treatment, plays a prominent part. The author attributes the largest measure of success to light and heat treatment.

Along this line the following procedure is observed at the gynecological clinics of the Erlangen University. When the acute or subacute condition has subsided short "test exposures" are performed; a hot water bottle, an electric heating pad or heat under the light bath for the trunk may be tried at 80 to 90 degrees for 10 minutes. If this is tolerated without any trouble, the abdomen is radiated by the spectrosol lamp, which is a 1000 watt metallic filament lamp filled with gas and coated by a glass permeable to rays of a 290 millimillimicron wave length. At the onset the light is given for 5 to 10 minutes, and daily increased by five minutes to one hour. After four or five days a vaginal lamp is added. This is a narrow cylindrical carbon filament lamp, surrounded by a glass tube and adapted for the vagina. It was devised by Seitz. By the regulation of resistance it is adjusted to an initial temperature of 60 degrees and after five minutes lowered to 45 degrees. The vaginal lamp is first left in the vagina, for 20 minutes, and then gradually increased to 60 minutes. Besides these measures a hot water bottle is constantly used in the bed, and an electric heating pad may be administered twice daily for one hour. These measures may be varied by the application of a vaginal pear-shaped flusher, a plain glass instrument, through which a continuous stream of hot water is driven; by hot damp abdominal packs; by mud casts, etc. After a fortnight vaginal ultraviolet therapy by special attachments may be employed, using the alpine sun or the ultra sun or Jove's lamp. When one sees that local light and caloric treatment are well tolerated, diathermy can be resorted to. This is usually the third week and the dosage is cautiously ascertained. In the beginning several treatments with a medium intensity of the current for a 10-minute period every other day will do. Later daily exposures of 20 minutes duration with higher amperage are permissible: By the fourth week the patient, unless she is overtired by the light treatment, may be given general light and heat therapy (spectrosol light, carbon arc light, sollux lamp, etc.). The general treatment should be given cautiously since injuries to the system as a whole may easily lead to local recurrences.

Indications for gynecological light and heat treatment are as follows: Inflammatory affections of the external genitalia, furunculosis, herpes genitalis, vulvitis and diseases of the vagina. Light and heat treatment in gonorrhea by means of the vaginal irradiation lamp of Wintz, which is a small tungtsen filament lamp of great light intensity, is of value when associated with medical therapy. In ulcerations and epithelial defects of the vagina ultraviolet irradiation is very useful. A further very grateful field for light treatment is also afforded by diseases of the portio (erosions and after-care following amputation). Light treatment is furthermore indicated in inflammations of the cervix and possible congestion of the corpus with associated enlargement due to certain displacements, e. g., retroflexion. Inflammation of the pelvic connective tissue and peritoneum are also indications for physical therapy. Pyrexia and hemorrhages are considered to be contra-indications to treatment with light and heat.

Ueber Die Roentgenbestrahlung Des Inoperablen Ovarialkarzinoms. E. Vogt. (On roentgen irradiation of inoperable ovarian cancers.) Strahlentherapie, 32:640-650, No. 4, June, 1929.

In malignancies of the ovary the findings at operation are the chief factors in deciding its operability. Only when the abdominal cavity lies open can it be seen whether and to what extent the neoplasm can be removed. After every incomplete operation for ovarian carcinoma x-ray therapy should be tried. It must be borne in mind that this step is always merely an attempt, since the roentgen sensibility of epithelial neoplasms of the ovary varies. The roentgen irradiation should be given as soon as possible, from the third to fifth day after the operation and before ascites has again collected. Vogt, in two cases found evidence, by a second follow-up laparotomy, that the roentgen rays had favorably influenced the neoplasmatic masses which by necessity was left behind after tapping the ascites at the first operation. In the first case the metastases had considerably receded so as still to permit of performing the radical operation. In the second case, which in the beginning was inoperable at the first laparotomy, roentgen irradiation demonstrated once more that the radical operation could nevertheless be successfully performed later. True, previous roentgen irradiations can render a second operation somewhat more difficult, but not to such an extent as to give rise to more serious technical difficulties. Relapses following the radical operation or incomplete interventions respond to roentgen ray irradiation in various ways. If the neoplasm can be approached through the vagina, radium treatment may also be applied. In inoperable cancers of the ovaries, and in presence of ascites, exploratory laparotomy with longitudinal incision and tapping of the effusion is the method of choice.

L'Ephedrine Synthetique Pour Lutter Contre Le "Petit Mal Des Rayons." Denier. (Synthetic ephedrin a remedy against "slight" x-ray sickness.) Bull. et. Mem. de la Soc. de Radiol., 17:177, No. 160, June, 1929.

On treating postoperative nodes which developed in the incision line after amputation of the breast, associated with swelling of the supraclavicular glands, nausea and gastric spasms occurred. Deep roentgen treatment given with 40 cm. spark gap and 3.55 mm. 10 Zn. plus 2 mm. Al, was of necessity repeatedly interrupted by reason of these accidents. Further irradiations were, however, admirably tolerated when the patient was taking synthetic ephedrin (levogyrate) 5 cg. three times a day.

Further observations concerning the use of this remedy against x-ray sickness showed that its action on this state was a regular and specific one.

Die Schaeden Einer Zu Fruehzeitigen Massage Bei Verletzungen (The Mischief Due to Early Massage in Injuries). Muncher Med. Wochenschr. 76: 542, No. 13, March, 1929.

In all fresh injuries there are two points to be taken into consideration, viz., the immobilization and management of bloody and serous effusions which occasionally spread far beyond the field proper of the injury. These effusions are associated with two disagreeable features; first, preventing or handicapping the supply and discharge of blood and lymph, and, second, inspissating and thus seriously hampering its dissipation, by delayed or improper effleurage. Cornelius therefore pleads for early and cautious effleurage. One must, however, individualize each case and remember the possible complications of too early massage, such as after-bleeding, thrombosis and embolism. If, according to Boehler, massage and passive movements produce pain and other difficulties, it is not to be attributed to the massage, but to its having been performed viciously. The first massages should be given as lightly as possible; one must, in the beginning, cautiously keep to the borders of the effusions and only by degrees systematically approach the main focus. If these points are observed and followed, massage will not prove harmful, but on the contrary beneficial.

Die Behandlung des Durch Massage und Passive Bewegungen Erzeugten Knochen—Und Muskelschwundes mit Gipsverbaenden und Dessen Verhuetung. Lorenz Gohler. (Joint and Muscle Atrophy Caused by Massage and Passive Movements Prevented by Plaster of Paris Bandages). Munchner Med. Wochenschr. 76:246-248, No. 6, Feb., 1929.

All injuries present the same symptoms: On attempts at motion there appears spontaneous pain. Pain is at the base of the general condition. As the limb is painful, it is not used, and atrophy of bone and muscles follow. If the injured limb is given a firm support, preferably in the form of light, unlined plaster of paris bandage, pain disappears; the limb can be moved actively and no appreciable bone or muscle atrophy occurs. Boehler thinks passive movements and massage in fresh traumas to be one of greatest injury. In healed bone fractures massage does very good service. Medico-mechanics will, of course, always occupy a prominent place in medicine. They are to be applied in due place and season but must not be considered a panacea. The author is a follower of reeducation in fresh injuries; he means by that the complete, uninterrupted immobilization of the injured part of the body together with simultaneous active movement of as many joints as possible or of all joints and avoidance of any pain.

Ricerche Sperimentali Sulla Radioterapia dei Processi Infiammatori. Ottavio Businco: (Experimental Researches into Radiotherapy of Inflammatory Processes). Radiol. Med. 6:600-606, June, 1929.

On the basis of his animal experimentation the author arrives at the following conclusions.

The irradiation of inflamed lesions with small therapeutic doses of x-rays shortens the duration of purulent inflammations caused by the bacilli of Eberth.

The favorable effect is due to the marked hyperaemia of the connective tissue, caused by the pro-

liferation of reticulo-endothelial elements of the subcutaneous, connective tissue, and by the ready formation of bundles of fibroblasts which bar the infiltrative and necrosing process in some as yet unexplained physical way.

A biological reaction is also recognized. It is the author's opinion that definite substances are liberated by the destruction of cellular elements in the antibacterial fight, and that the reticulo-endothelial cells, stimulated by the rays, transmit to the circulation immunizing substances generated in excess.

Experimentelle Versuche Ueber Die Anregung Des Haarwuchses Durch Aeussere Behandlung. Elso Eichholz. (Experimental Attempts at Stimulating the Growth of Hair by External Treatment.) Dermatologische Wochenschr, 88:161-170, No. 5, Feb., 1929.

Experiments of Eichholz concerning the growth promoting action by various measures demonstrated that alpine sun, besides the Cignolin, yielded the best results as to the growth of hairs. The alpine sun works by intense stimulation and hyperaemia, and the hair papilla thus receives a corresponding larger quantity of nutrition.

According to Thedering x-rays are presumed to exert a favorable influence on hair growth if administered in so-called "stimulative doses," it is however, still very doubtful, if small x-ray doses are apt to stimulate the segmentation processes of cells. On the contrary treatment with alpine sun in the form of quartz light has stood the test, especially in alopecia areata.

Ein Beitrag Zur Behandlung der Lungentuberkulose mit der Kuenstlichen Hoehensonne. J. E. Kayser-Petersen. (Contribution to the Treatment of Pulmonary Tuberculosis by Artificial Sunlight.) Munchner Med. Wochenschr., 76:995-996, No. 24, June, 1929.

The dangers of treating early infiltrations with any one stimulative therapy, including that of the quartz lamp, has already been emphasized by Romberg. The author refers herein to a case of injury in a girl 18 years of age. She exhibited a typical left infraclavicular infiltration. The author proposed collapsotherapy which promises good results in such cases, but it was refused. The patient underwent a course of alpine sun irradiation. On re-examination some months later, the author roentgenologically ascertained an annular shadow which was twice as large as the former lesion. The comparatively prompt disintegration of an infiltration, which was in chronologic relation to the irradiation by artificial sunlight, should be a warning for using quartz light irradiation in such cases.

Apropos de la Radiotherapie de L'Asthme. J. A. Huet and Sobel. (On the Radiotherapy of Bronchial Asthma.) Bull. et mem. de la Soc. de Radiol., 17:169-171, No. 160, June, 1929.

The author reports six cases of bronchial asthma associated partly with tracheobronchial adenopathy, partly with fibrosclerotic alterations.

Two fields were irradiated each anteriorly and posteriorly. The posterior ones, one of which lay on the nape of the neck at the level of the last cervical and first dorsal vertebrae, measured 8 by 10 cm., the other close to that below was located in the interscapular space. Spark gap 25 cm., 2½ MA., 30 cm. focal distance, filter 5 mm. Al., 500 R per field.

Both posterior fields were cross-fired parasternally at one exposure; the two anterior ones three days later.

It was never necessary to give more than ten irradiations. The improvement started between the fourth and sixth exposures; cures occurred mostly after the eighth exposure. Generally speaking, the doses given were feeble, never exceeding 2000 R per field.

Die Behandlung von Gebaermutterblutungen Durch Milzrestrahlung. Felix Gal. (Treatment of Uterine Haemorrhagias by Irradiation of the Spleen.) Strahlentherapie, 32: 694-703, No. 4, June, 1929.

Irradiations of the spleen were first recommended against parenchymatous hemorrhagias by Stephan, and against uterine hemorrhages in 1921 by Vogt. Gal has tentatively applied this procedure in 26 cases; only such cases were selected which had already been treated according to a variety of other methods for some length of time. The majority of cases were selected from girls 15 to 22 years of age, for the most part virgins. Also seven women, the oldest of whom was 39 years of age. In all these patients there occurred metropathias of various degrees; most of them had shown definite menstruation difficulties from the start. Finally a 51-year-old woman suffering from a huge fibroma was irradiated because of strong, protracted hemorrhages. Gal obtained appreciable successes in all these cases by spleen irradiation. It is admitted that although the treatments do not reach the cause of the trouble, the effect is lasting, if not permanent. Time, however, is gained by the possibility of stopping the severe hemorrhages in most cases, and thus avoiding larger emergency interferences, e. g., curetting in virgins or large mutilating operations in women. An immediate favorable effect is to be reckoned upon in almost every case, especially in those cases in which irradiations were given several times. As soon as the immediate danger is over it will be possible to correct the difficulty by way of other treatment. There is a lack of explanation as regards the mechanism of its action; it might seem most plausible to consider this method as non-specific proteinotherapy which acts on the thrombopoetic substance by cell disintegration.

Technic: The spleen dullness is ascertained by percussion in lateral lying position, the irradiation is directly administered on the marked area. From ½ to ¾ S.U.D. were given by a symmetry apparatus with a spark gap of 43 cm. By means of Coolidge tubes the rays were filtered through ½ mm. Zn plus 2 mm. Al. Focal distance 25 cm.

Die Behandlungserfolge mit Kleinsten Strahlendosen bei Hautkrankheiten. A. Fuhs and Josef Konrad. (Results of treatment with minimum ray doses in diseases of the skin.) Strahlentherapie, 1929. Vol 32:711-814, June, 1929.

The method of local treatment with x-ray dosage as advocated by Thedering has given the authors satisfactory results in dermatoses characterized by great sensitivity to x-rays and frequent relapse. It is particularly indicated when patients can at the same time undergo some other convenient, dermatological treatment. It offers advantages that up to now no cosmetic injury ever had. Even when used frequently, there is greater evidence of recession of objective symptoms than when salves, painting or pastes are used. The combination of both measures is, however, considered the most logical procedure. The results are based on a series of 290 cases. Favorable effects from this treatment were obtained in 244 cases, viz., acne vulgaris, acne varioliformis, chronic eczema, erythema induratum Bazin, furunculosis, lupus vulgaris, psoriasis vulgaris, sykosis and sluggish ulcerations. Failures in 46 cases, viz., acne rosacea, alopecia, mycosis fungoides and pruritis.

Physikalische Therapie der Hautkrankheiten. Herbert Fuhs. (Physical therapeutics of diseases of the skin). Wiener Klin. Wochenschr. 42:361-366, No. 12, March, 1929.

Diathermy is applied in dermatology chiefly as a local heating procedure. Duration of an exposure at least 20-30 minutes; if necessary, the heating is repeated daily or from two to three times a week. It merely produces local rise of temperature with a view of promoting metabolism and reactivity of the tissues and thereby the tendency to heal. The optimal strength to be chosen is that which provokes just an agreeable sensation of heat in the treated parts of the body. Cutaneous sensibility is a warning to be extremely cautious. The promotion of circulation and the resulting stimulation of nutrition and acceleration of absorption, all of them due to diathermy, are turned to account for certain cosmetic purposes (improvement of wrinkles, better vascularization of pale skin, decongestion of cyanotic parts, removal of edematous swellings of the face skin, e. g., of pockets under the eyes). The softening and flattening effect of diathermy manifests itself with regard to cheloids and hypertrophic scars adherent to the underlying layer. The author succeeded in favorably influencing sluggish varicose ulcers of the leg and similar therapeutically refractory x-ray ulcers by improving circulation and promoting local metabolism. The spasmolytic effect of diathermy is adapted to conditions of angioneuroses, acrocyonosis, Reil's dead fingers and the initial stages of Raynaud's disease. The anodine effect of diathermy manifests itself by the successful heating of the ganglion region in high grade zosteric neuralgia as well as in x-ray and radium keratoses and very painful roentgen ulcers Fuhs succeeded furthermore in obtaining marked alleviation with fulguration, in pruritus of the vulvar and anal regions.

Electrocoagulation is resorted to in a series of cosmetic diseases of the skin which have thus far been removed by the application of electrolysis and galvanocautery, as in hypertrichosis, pigmented marks, naevi and acne rosacea. Besides telangiectasiae, small papillomata, fibromata mollusca, mollusca contagiosa, miha, verrucae planae and vulgares are obliterated. Also xanthelasmata of the eye lids occasionally lend themselves to treatment by electrocoagulation.

Fuhs applies also borderline rays in the dermatological practice. Depending upon the type of affection from two to six dose-units as recommended by Bucky were administered per port of entry and exposure. A maximum voltage of 9 KV proved optimal in skin therapy. The resulting erythema clears up within a few weeks. If treatment is very intense the pigmentation remains for a very long period and is cosmetically disfiguring. Never, however, could any remote injuries such as telangiectasiae or ulcers be ascertained so far, although the cases have up to date been followed up for more than one year. The author warns explicitly that in consideration of remote injuries the space of one year is still too short a demonstration of the harmlessness of borderline rays for the skin. In sycosis simplex and blepharitis—at least in a series of cases—considerable improvement could be obtained by borlerlines. Most striking, however, were the successes obtained in erythema induratum Bazin, especially in its ulcerated type. Among the cocci diseases hydrosadenitis follicularis responds best to borderline rays; paronychias, too, especially of coccogenous and mycotic origin showed marked improvement. Amng diseases of the blood and allied processes Fuhs could ascertain ready recession of the manifestations in lymphogranulomatosis and premycotic, psoriasiform plaques. Prolonged observation must demonstrate the stability of this effect.

Technik der Gesichsdiathermie. Hugo Fasao. (Technic of facial diathermy.) Wiener Klin. Wochenschr. 42:399-400, No. 13, March, 1929.

Diathermy to the skin of the face requires a particularly exact technic especially the application of various electrodes. It is above all of importance to put on the different electrode equally and firmly. Of equal importance is the connection of the cord-ends with the face electrode. The form of the face, its various contours and inequalities, and its wrinkles require great attention. The common lead electrodes answer the purpose only when applied to the forehead or small areas of the cheek. Tinfoil, which is easily adaptable, was recommended by Bergomier and answers the purpose better. It must be covered with a cotton pledget and accurately fastened down. The connection of the cord is somewhat difficult because tin foil tears easily. Last has recommended a facial mask, which is proprietary and not on sale. The author himself uses for diathermy *Plastelin* which is perfectly and easily mouldable, and

adapts itself well to all contours. A rolled plastelin plate some mm. thick is first adequately fashioned by a moulding rod. The inner surface of this non-conducting plastic mass is coated with tin foil and a ring-shaped peripheral area the size of a half-cent and tin-foiled on each side, is bent up in order to receive the cord. The cord itself must not be as heavy as are the usual diathermy cords. As facial diathermy is carried out in prone position, fixation can as a rule be dispensed with; at times a light sand bag is recommendable. The indifferent electrode, a sheet metal plate measuring 400 square centimeters lies on the nape of the neck.

A direct and plastic conducting mass applied to the skin does excellent services. It consists of the ordinary moulding clay as used by sculptors, and possesses a certain conductibility due to its dampness. The author succeeded in increasing the latter by adding an electrolyte. The cord is connected with an auxiliary cord bearing a small wire net which is attached to the clay clectrode. Also *Negocol,* a hydrocolloid, contrived by Dr. Paller, is recommendable; when warmed and fastened on, it soon forms an elastic mass which is itself conducting owing to its dampness. The conductibility can be increased at will by the addition of brome powder, copper, etc.

It is understood that great caution is to be used in facial diathermy.

Erfahrungen Ueber die Wirkung von Kohlensauergas-Baedern und Kohlensaueregasinhalationen. Wessel. (Experiences on the effect of gaseous carbonic acid baths and inhalations.) Zeitschr. f. wiss. Baderkde 1929, 3:539-542. No. 6, March, 1929.

The author calls attention to gaseous carbonic acid baths containing radium which he has introduced anew at the bathing resort Meinberg (Lippe). They produce a distinct sensation of heat on the skin, and much more marked than that due to a bath of the same temperature prepared of liquefied carbonic acid in containers. The author prescribed baths of a temperature of about 20 degrees C. Benefit was derived from these cool, dry gaseous carbonic acid baths in exophthalmic goiter, general nervousness, neurasthenia, nervous sleeplessness and heart neurosis. In neuritides, e. g., sciatica, but also in rheumatic, gouty and other diseases of the joints. Electric light baths, in which the air was replaced by carbonic acid heated to 60 degrees C., gave very satisfactory results; also a combination of dry carbonic acid with hot water-steam, in the form of vapor douches has proved very efficient.

Tastmassage. W. Ruhmann. (Palpation massage.) Munchner med. Wochenschr. 76: 278-280, No. 7, February, 1929.

Local therapeutic measures against muscular rheumatism (medicinal and physical) is always directed at allaying the painful condition and increasing the blood supply of the diseased parts. It is particularly a refined method when the finger tip of a trained physician introduces the palpation in case of muscular lesions, such as nodosities. "Tastmassage" modifies the hyperalgesic state, increases blood supply, and effects relaxation of hypertonus. In short, it is an expedient method of treatment of chronic muscular rheumatism. Palpation massage enables the physician to recognize and treat muscular nodosities. This procedure consists in sliding the skin over its substratum by plain palpation with the finger pulp without lubricants or powder. The terminal phalanx of the middle finger rests as flatly as possible on the surface to be massaged, whilst the movement proceeds sideways, from the forearm, in a to and fro motion. "Therapeutic palpation" is useful where heavy, tender nodosities are felt beneath the subcutaneous layer. It is performed under somewhat stronger pressure and passes from sidelong motions to circular finger excursions at the spot of obvious resistance; this therapeutic palpation must always be aided by the "exploratory" palpation. With each additional treatment the intensity of therapeutic palpation massage is gradually to increase; never, however, should the position of the fingers to felt as "drilling;" the treatment itself is somewhat painful. About 20 sittings of from 15 to 20 minutes will ordinarily suffice. The subjective improvement is usually intermittent. Rheumatics treated by palpation massage frequently remain free from pain for up to one year.

Ruhmann recommends previous treatment by the application of local irradiations with red light.

Torfbaeder, Eine Neue Form der Waermeanwendung. Carl Reitter. (Peat baths, a new form of heat application.) Wiener mediz. Wochenschr. 79:261-262, No. 8, Feb., 1929.

There are a series of bacteria, the so-called thermophilous bacteria, which attains the optimal growth only at higher degrees of temperature, break down carbohydrates and proteins under oxygen absorption, and thereby liberate heat. Two chemists (Dr. Szucz and Dr. Kuh) conceived the idea of imitating these conditions by adding first carbohydrates to the peat and then inoculating it with a mixture of thermophilous bacteria and fungi, selectively made up of non-pathogenic microorganisms for animals. They are: Odium lactis, bacteria mesentericus, bacteria subtilis, and bacteria calfact. In this manner it is possible to obtain a temperature of nearly 70 degrees C. in such a peat mixture and so to maintain it for almost 48 hours. Reitter has applied the material thus prepared for caloric treatment of affections of the joints, especially those with effusions and thickening of the capsules, with good results. It would seem that the comparatively dry mode of application is of advantage; patients being thus enabled to tolerate temperatures up to 60 degrees C. for several hours. The application can also be extended to the whole of the body if given in the form of a "complete bath.' Heed should be taken that the temperature does not exceed 50 degrees. This is easy to obtain by loosening and shifting the material while the patient is embedded in this peat mass. It is thus possible to

cause the patients to sweat profusely, which is well known to be very beneficial in certain chronic affections of the joints.

Warzen und Warzenbehandlung. Erich Langer. (Warts and Wart Treatment.) Mediz. Welt, 3:200-202, No. 8, Feb., 1929.

The author evaluates the various methods in the treatment of warts: Medicinal, vaccines and physical measures. Among the latter x-raying, electrolysis and electrocoagulation compete with one another. When using one of these methods one should from the very outset make sure that the treatment does not do greater damage than the warts themselves. Although irradiation by feeble dosage will completely suffice in the treatment of the plane warts, the dosage administered to the more stubborn warts sometimes borders on injurious effects. Radium and mesothorium therapy, too, are not always without their unpleasant sequellae. Complications were seen despite initial beneficial effects; the cosmetic results being at least as unpleasant as the warts themselves, e. g., atrophies, telangiectasiae, etc. In cases, however, in which all the other methods of treatment have failed, an exactly prescribed roentgen-ray and radium treatment must ultimately be resorted to. With electrolysis and electrocoagulation the reaction is somewhat different. The author has given up the former method in favor of the latter. He feels that beneficial effects are more easily and readily obtained by electrocoagulation than by electrolysis. The scars are finer and smoother after coagulation than after electrolysis. Furthermore, these procedures are successful only in the hands of physicians skilled in the specific technic. It is advisable to soften keratotic warts by salve or prolonged soap-bath previous to coagulation.

Frostschaeden. Erich Langer. (Frost bite.) Medizin. Welt, 3:279-280, No. 8, Feb., 1929.

When acute inflammatory symptoms have cleared up, baths with alternately cold and hot water which is changed every ½-1 minute are advisable. The efficiency of such baths is aided by adding tannine (1 gram per liter), oak bark (1 handful, decocted), liquor aluminii acetici or ormicet (1 tablespoonful per liter) to the water. After the bath the extremity should be energetically massaged centripetally with an indifferent salve or some other remedy mentioned below against freezing. Very great benefit has been derived from diathermy in the treatment of frost bite. The technic is as follows: Ten minute sittings and afterwards prolonging them up to half an hour or three quarters of an hour. Also cautious and not too energetic alpine sun and quartz lamp irradiations are indicated in such cases. Besides these physical methods salve bandages (5 per cent ichthyol petrolatum, 10 to 20 per cent thigenol petrolatum) should be ordered for the night. Against chilblains, camphor salve, Peruvian balsam salves or similar preparations as frostin salve, amasin salve should be first of all ordered in the acute and later stages. Chilblains especially respond, together with the ointment treatment, particularly well to baths with alternately cold and hot water, to hot air and diathermy, and frequently to paraffin packs. The same is true of "red hands." In refractory cases good results may be obtained by x-raying.

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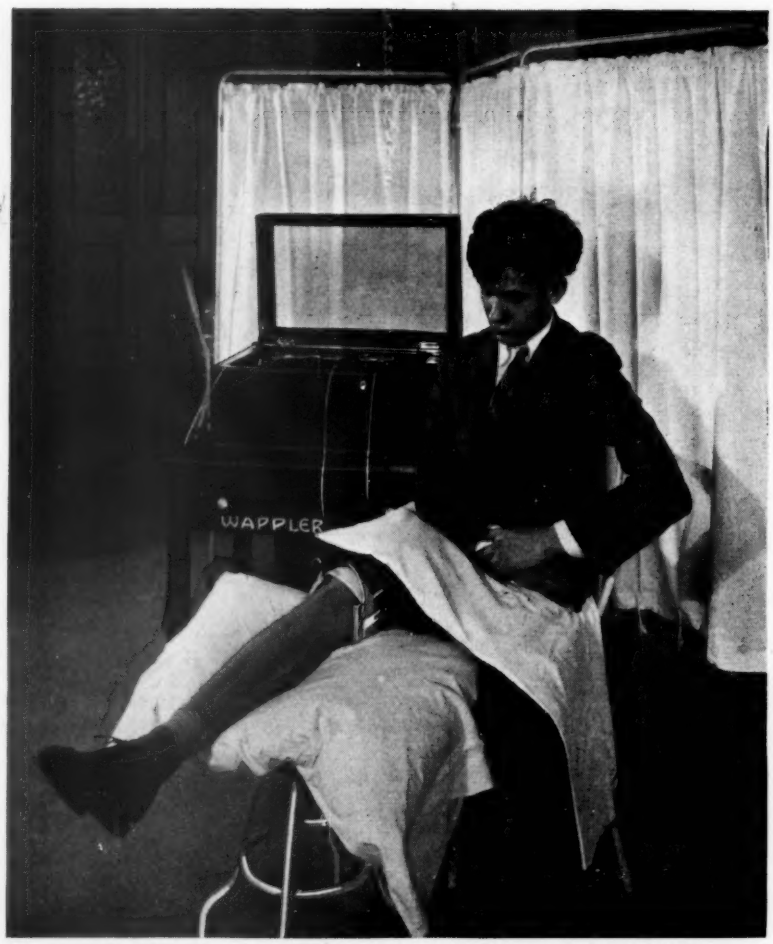
Diathermy to the Knee



Courtesy of Richard Kovacs, M.D., Clinical Professor of Physical Therapy, Polyclinic Medical School and Hospital, New York City.

DIATHERMY to the knee is indicated in cases of sprains, strains, dislocations, synovitis, bursitis, arthritis of subacute and chronic type, traumatic myositis of both acute and chronic variety, and complications of fractures such as painful or exuberant callus. Being a sedative, diathermy relieves local pain. It produces a local hyperaemia increasing the local metabolism and promoting the resorption of inflammatory exudates. However, it should not be used in cases of acute inflammatory processes accompanied by fever or in cases of non-draining suppuration.

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